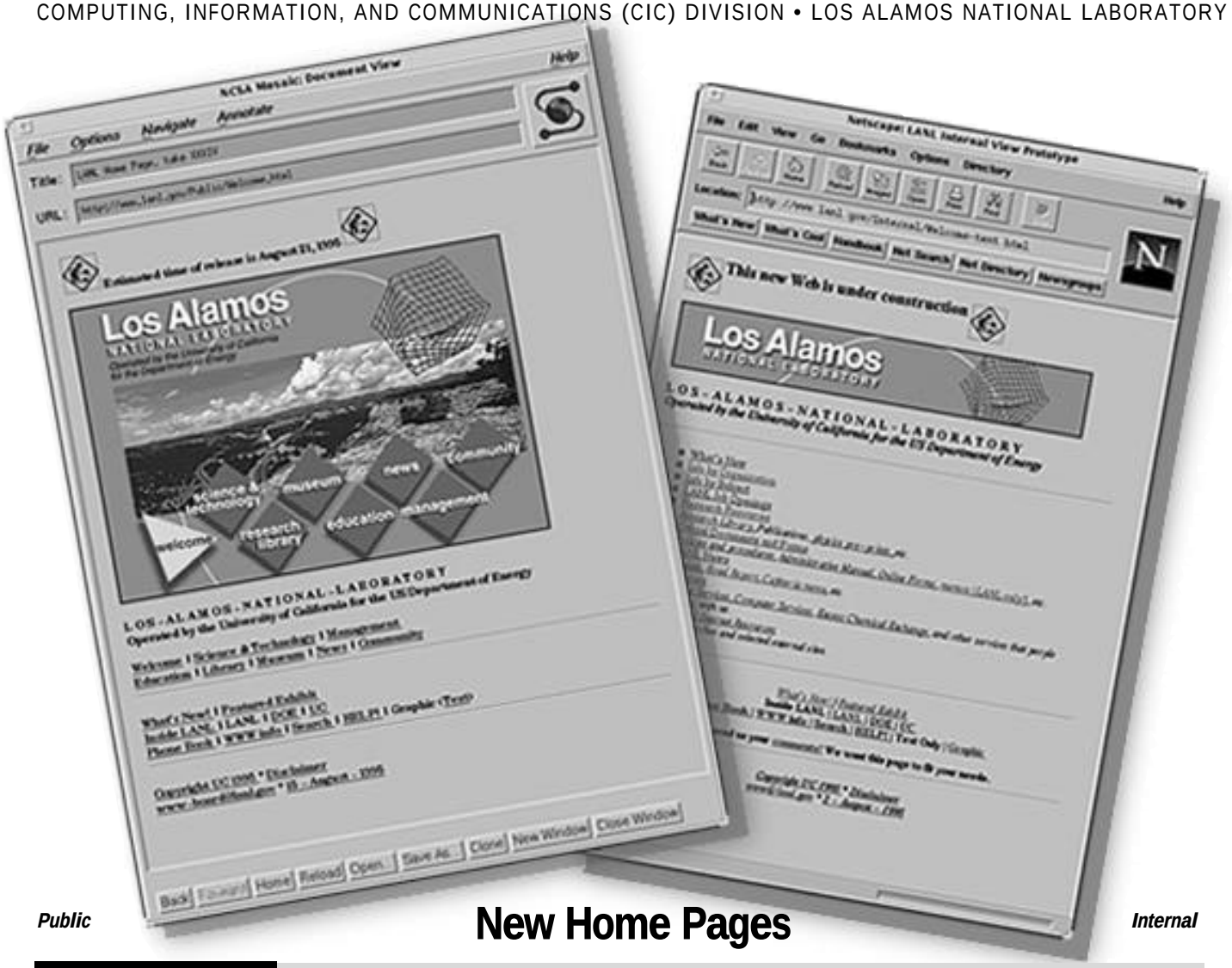
BITS
computing&communications news

SEPTEMBER 1995

COMPUTING, INFORMATION, AND COMMUNICATIONS (CIC) DIVISION • LOS ALAMOS NATIONAL LABORATORY



Public **New Home Pages** *Internal*

Inside this issue:

CIC Customer Service Center . . . . . (505) 665-4444 or cichelp@lanl.gov

Integrated Computing Network (ICN)

Consulting:

Centralized scientific and engineering computing .....consult@lanl.gov or 7-5746

Lab-wide administrative and business systems .....labwide@lanl.gov or 7-9444

Passwords (required for access to ICN) .....validate@lanl.gov or 5-1805

Systems documentation (local and vendor supplied).....7-6992

Central Computing Facility (CCF) 7-4584

Advanced Computing Laboratory (ACL) 5-4530

Desktop Support Center (DSC) 7-4357 (7-HELP)

(PC Help for IBM and Macintosh personal computers)

For questions about PC software: PCSW-help@lanl.gov or 7-5884

For questions about PC hardware: PCHW-help@lanl.gov or 7-9372

For Macintosh questions: Mac-help@lanl.gov or 5-1361

For UNIX questions: UNIX-help@lanl.gov or 5-0433

For groups with CIC-2 support contracts: 5-2220

Telephone Services Center 7-3400

(includes voice mail)

Computer training

Lab-wide systems support training.....7-9444

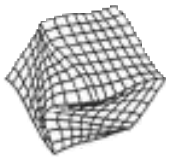
Computer/workstation training.....7-9399

Personal computer training.....7-9071

Microcomputer support facility seminars.....7-4357

(Macintosh/IBM software, lending library)

List of Forms and Schedules

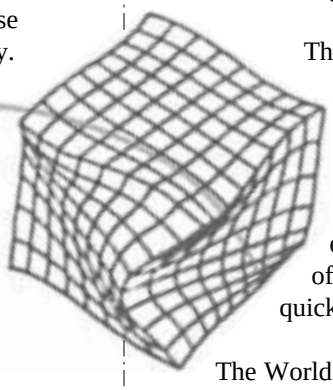


The World Wide Web at LANL

Welcome to the new BITS section that focuses on the World Wide Web (WWW) and its development at LANL. This new section is designed to keep you informed about the many efforts here at LANL that make effective use of this relatively simple but very powerful technology. This month we have several Web-related articles. (See the cover page table of contents for titles and page numbers.) We hope this new section will provide you with pertinent and timely Web-related information.

The World Wide Web: Past and Present

A Short History of the WWW



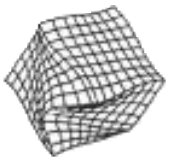
The Internet, which is the global network of networks that evolved out of defense research networks (arpanet and milnet) and academic research networks (USENET and NFSNET), opened up to commercial traffic in 1993. The Internet allows computers from around the world using the same set of protocols to communicate with each other quickly and efficiently.

The World Wide Web, also known as WWW or "the Web," is an extremely popular and rapidly growing phenomenon on the Internet. The WWW is a distributed, network hypermedia system whose intellectual roots go back decades if not centuries in humankind's quest for the one universal mechanism for maintaining all human knowledge in a single, logical repository.

The most well known of early conceptual models and prototypes of a hypertext system is perhaps Ted Nelson's Xanadu project, which started in the early 60s and continued well into the 90s. An excellent article on the system can be found in the June issue of Wired Magazine (http://www.wired.com or http://www.w3.org/hypertext/WWW/Xanadu.html).

In the mid 80s, Hypercard for the Macintosh popularized the hypertext concept in a desktop utility that made it much easier to organize large collections of data using the hypertext paradigm (http://www.apple.com).

By 1990, Tim Berners-Lee, a scientist at CERN (the high-energy physics facility in Switzerland), had developed a prototype for the WWW that introduced a simple protocol known as the hypertext transfer protocol (HTTP) and an equally simple document specification language known as the hypertext markup language (HTML). HTTP and HTML were initially used by the scientific community for sharing papers simply and powerfully over the network (http://www.cern.ch or http://cuiwww.unige.ch or www.w3.org).



These two specifications, along with a number of implementations and many documents, were to become the WWW. In 1993 Marc Andreeson of the National Center for Supercomputer Applications (NCSA) in Illinois released an almost equally simple client application known as Mosaic, which allowed people to browse the WWW. At that time, only 50 WWW sites were known to exist. (The LANL Web, based on the existing gopher service, was forming at this time).

The WWW Comes of Age

After the introduction of Mosaic the WWW grew explosively. Recent estimates indicate that the WWW has millions of Web sites with hundreds of millions of Web documents and tens of millions of clients on the WWW (http://www.ncsa.edu).

The WWW has gone through many major changes during the past year and it has become undeniably the most popular use of the Internet. For millions of users who started using the Internet within the past year or two the WWW and e-mail ARE the Internet.

The Internet and the Web are moving very quickly. A year ago Mosaic was the browser of choice. It offered a graphical interface and a similar interface for Macs, PCs, and X-Windows systems. This year Netscape Navigator, the flagship product of Netscape Communications, is arguably the leading client application on the WWW. This came as no surprise since the original author of Mosaic and the founder of Silicon Graphics teamed up to form Netscape Communications (formerly Mosaic Communications) just over a year ago, releasing the Netscape Navigator last Autumn. Many of the NCSA people who helped nurture Mosaic joined Netscape Communications to create the next generation WWW browser. Netscape Navigator offers new features like a broader range of in-line graphics, an integrated USENET News browser, a more common appearance across platforms, and some basic security features when used with a security server (http://www.mcom.com or http://www-cic2.lanl.gov/netscape.html).

This year the W3 Consortium was formed out of the informal W3 organization to coordinate the development of the WWW around the world. Managed by MIT and by INRIA (Institut National de Recherche en Informatique et en Automatique) in cooperation with CERN, the W3 Consortium is aggressively working alongside the Internet Engineering Task Force (IETF) working groups to define and develop Internet standards related to the WWW. Los Alamos joined the W3 Consortium this month. LANL's membership was delayed by legal issues over ownership of software and other products that might be developed by the W3 Consortium (http://www.w3.org).

The Development of WWW at LANL

LANL is currently contributing directly to the IETF working group in the area of universal resource characteristics. LANL's IETF representative Ron Daniel authored or co-authored 6 papers that he recently defended at the IETF meeting in Helsinki, Finland (http://www.acl.lanl.gov/URI/uri.html).

LANL was one of the first DOE Laboratories to embrace these new technologies and maintains one of the largest Webs of its kind, including over 100 servers and at last count over 15,000 pages (http://www.lanl.gov).

LANL has several well known Web sites and WWW celebrities. Paul Ginsparg created the "Physics Preprint Server," which has been used as a model for many other servers that provide a repository for technical documents for a global audience. It may not be pretty but it is used by a lot of people (http://xxx.lanl.gov). Rob Hartill, who also works on the preprint server, has a double claim to fame as author of the famous "WWW Movie Browser," developed while he was at Cardiff in the United Kingdom (http://www.cm.cf.ac.uk/Movies/). More recently Rob is noted for his work on the popular "Apache" web server, a derivative of the NCSA Web server (http://www.apache.org). Philip Greenspun, formerly of the Advanced Computing Laboratory (ACL) at LANL, won acclaim for his early WWW-based travelogues, "Travels with Samantha" and "From Paris to Prague" (http://www-swiss.ai.mit.edu/webtravel/). As part of the new organization of the LANL Web, plans are underway to give credit to these and other people who are obtaining worldwide fame for their work on the WWW.

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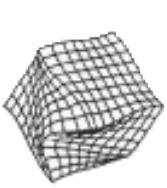
Distributed Computing Group (CIC-8)



CIC Division and the WWW

New LANL Home Pages

For several years LANL's WWW "home page" (www.lanl.gov) has remained essentially unchanged. An initiative lead by CIC Division has produced a new organization characterized by two new LANL home pages: one for external users and one for internal users. The external, or public, home page is designed for people outside the lanl.gov domain while the internal home page is intended to assist internal people with their everyday tasks. The internal home page has been modestly reorganized to remedy a number of long-standing problems with its original design and subsequent evolution.

The public home page is managed by a board of editors from several organizations around the Laboratory who have a stake in LANL's public image. These organizations include Public Affairs, Community Involvement and Outreach, Research Library, Science and Technology Base Program, Laboratory Leadership Council, Communications Arts and Services, and Information Architecture Project.

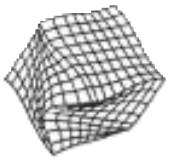
The internal home page continues to be managed by the WWW core team (www@lanl.gov) in CIC-8 but with significant input from customers and the informal CIC WWW team (wwwteam@lanl.gov) and the Information Architecture Web team (http://www.lanl.gov or http://www.lanl.gov/Internal/ or http://www.lanl.gov/Public/).

The CIC Web Team

The CIC Web team (also know as the "core web team" or "www@lanl.gov") is lead by the Distributed Information Systems team out of CIC-8 (Distributed Computing Group). The team members are Steve Smith, Kaki Kelly, and Elise Lee from CIC-8; Lauren McGavran and Lee Ankeny from CIC-12; and Ron Daniel from the ACL. With very limited direct funding, the Distributed Information Systems team is chartered to "manage the Web" (a task similar to herding cats), which includes developing www.lanl.gov related services and technologies in the area of distributed information systems. Related work involving network searching and navigating, maintenance of the legacy gopher services, and development of new standards is included in this charter. Their charter also includes forming a larger informal CIC WWW team in an attempt to coordinate the efforts that each group was pursuing independently.

The extended CIC WWW team includes members from the groups listed below. All CIC groups have some involvement in the Web.

- ACL: Research in Uniform Research Characteristic (URC) services, IETF, W3 Consortium involvement;
- CIC-1: Design, Writing, Editing in HTML for WWW;
- CIC-2: Desktop Support, Netscape/Netsite/Acrobat/ SSL for Authentication;
- CIC-3: Research and Applications, Graphical Navigation, Tourism and Economic Development prototypes for the State of New Mexico;
- CIC-5: Network services, Phone Book, Smartcard Authentication, Hostmaster Database, Property Database;
- CIC-6: WWW Consulting, Training, BITS;
- CIC-7: Production Computing, HP Cluster Prototype for Secure Services;
- CIC-8: Distributed Information Systems Team, www.lanl.gov, Coordination and Leadership, Recharge Web Serving, Visualization/Video Lab;
- CIC-9: Photo Archives, Film Scans;
- CIC-11: NFS Services;
- CIC-12: Web Application Development;
- CIC-13: Jetform, Labwide Systems;
- CIC-14: Library Without Walls, Science Citation Index, Reference Librarian on the Internet;
- CIC-15: Index/Explorer, Policies and Procedures Manuals, Full-Text Search; and
- CIC-17: Scanning, Printing, Imaging.



The WWW Users' Group

The World Wide Web Users' Group (WWWUG) arose out of the Internet Information Systems Users' Group (IISUG). The WWWUG has held presentations almost monthly on topics of interest to the WWW community at LANL. Some of the past topics and presenters include:

- Netscape Server Technology (Netscape Communications);
- WebForce (Silicon Graphics);
- Security, Privacy, and Digital Commerce on WWW (Adam Cain, NCSA);
- Web Searching and Indexing (Verity); and
- The Uniform Resource Characteristic (Ron Daniel, www/ACL).

Future possible presentation topics include:

- Sun Microsystems;
- Hot Java;
- Netscape Communications;
- Netscape 2.0 OpenMarket Quarterdeck Star Nine; and
- Webstar (MacHTTP) Harvest InfoSeek Webster.

The WWWUG meets on the second Tuesday of each month from 10:00-11:30 with the primary focus being on a single presenter. For announcements of upcoming meetings, subscribe to "wwwug@lanl.gov" by sending "subscribe wwwug" (located in the body of your e-mail) to listmanager@lanl.gov.

Future Web-Related Articles to Come

There are several Web-related topics we plan to address in future articles of BITS. These topics include the following:

- **Web Browsers: Netscape versus Mosaic**
  One is free while the other has a site license at LANL. They also have different features you should know about so you can choose the one that suits your needs.

- **HTML Standards: Version 2.0 Evolves into 3.0**
  When standards move fast, practicality often leads to official sanction. Which elements should you use *before* they become official?

- **WWW Design Guidelines**
  Graphic design as well as organization are very important issues in Web authoring. The Laboratory is developing a few simple guidelines for using the Laboratory logo, giving appropriate credit, listing necessary contacts, and declaring copyrights and disclaimers.

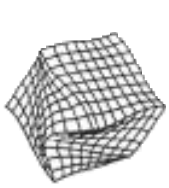
- **Responsible Use of the Internet and Release of Public Information**
  The Web is a publishing medium and it represents both a powerful tool for disseminating information and a major opportunity for embarrassing the Laboratory, such as giving away intellectual property rights and possibly even creating legal problems.

- **Internet Security and the Web**
  Despite the Internet's reputation for not being very secure, it is evolving to include a number of powerful security features and while the Web is noted for offering even less security, it too is adopting and developing security features as well. Here at the Laboratory, we have experience with, and a strong need for, secure but distributed information systems.

Steve Smith, sas@lanl.gov or www@lanl.gov, (505) 665-3377
Distributed Computing Group (CIC-8)

How to Get a Web Browser

If you do not have a WWW browser or know how to obtain one, talk to your system manager or call 7-HELP. You may also access the World Wide Web in a line-only mode by using telnet to access www.lanl.gov on port 1663 (%telnet www.lanl.gov 1664). However, we recommend using a graphical tool such as Mosaic or Netscape Navigator if at all possible. The address of the Los Alamos National Laboratory Web server is "http://www.lanl.gov" which should be set up as your default home page, although it may not be depending on the browser you use and how your system was set up.



User Assistance On-Line

The following functional areas have been identified for answering questions or providing help. Please send e-mail to the appropriate area.

- General questions about policy or services: www@lanl.gov;
- A single alias to reach all of the other areas: www-team@lanl.gov;
- Web browsers, helper applications, authoring tools: www-tools@lanl.gov;
- Web server installation and support, space on www.lanl.gov: www-service@lanl.gov;
- Authoring and design services for HTML and the Web: www-author@lanl.gov;
- Scanning of film or paper, optical character recognition: www-input@lanl.gov;
- Printing and imaging of Web (and other) documents onto film, paper, video, CD-ROM: www-output@lanl.gov;
- Help finding information on the Internet or within LANL: www-reference@lanl.gov;
- Design and implementation of authentication, encryption, access control for the Web: www-security@lanl.gov; and
- Information Architecture Web team: ia-area-web@lanl.gov.

Also, please consider joining and using the following distribution lists:

- Announcements related to the WWW user group: wwwug@lanl.gov;
- To ask specific questions of your peers about WWW issues: wwwug-help@lanl.gov; and
- To discuss WWW issues with a Laboratory-wide WWW audience: wwwug-talk@lanl.gov.

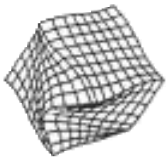
Web Developments at LANL's Research Library

During the past year the LANL Research Library has created a Web presence for itself. To accomplish this task, a Web core team was established consisting of Mark Martinez providing technical support; librarians Mona Mosier, Sharon Smith, and Jeane Strub providing home page development and coordinating the selection of appropriate subject links; and Allan MacKinnon representing the Library Without Walls (LWW) project.

Research Library Home Page

The Research Library's home page, which made its debut in November 1994, is located at http://lib-www.lanl.gov. This home page provides a link to general information about the Research Library including its collections, services, and publications, as well as links to other resources. Some of these resources are the Library's Online Catalog which is used for locating books and journal titles in the collection; Subject Resources for locating Internet information on physics, chemistry, biology/genetics, business, etc.; and Los Alamos Publications including LA reports, Dateline Los Alamos, LA Science, and Research Highlights. Also found from links on the home page are the LWW project (discussed later), Hot Topics (items of current interest to the Laboratory), Library Forms (forms for requesting information or literature searches, for purchasing journal articles or reports not in the collection, and for requesting reports found in the library), and links to other libraries within the state, the DOE community, and the nation.

Major effort has gone into the Subject Resources page. Librarians in the Research Library have responsibility for selecting appropriate Internet resources (such as the Table of the Nuclides and Standard Atmosphere Computation) in their assigned subject areas. The same criteria used in choosing a printed publication is used in choosing a Web resource; that is, the item selected must support the work at the Laboratory. The core team then takes these selected resources and provides the organization and HTML formatting for on-line presentation.



Library Without Walls Project

Several efforts within the LWW project are currently in progress. First is the on-line electronic document effort, which has a goal of capturing and displaying all Los Alamos report files in electronic form. The viewer for these report files is Adobe Acrobat, which creates files in PDF (Portable Document Format). Adobe Acrobat will run cross-platform on IBM DOS or Windows, Macintosh, and Sun SPARC UNIX. An advantage of using Adobe Acrobat is that Library staff can use it to create PDF files directly from any conventional document processing program. To read these PDF files, Library customers must have Adobe Acrobat Reader, which is available free from CIC-2 (call 7-4357 for more information). The PDF files can be accessed through the Research Library home page via the World Wide Web.

Library staff is also attempting to capture and archive all new electronic files for LA, LALP, and some LAUR reports. Publishing the new LA reports on-line has moved from a pilot project to full-time production as a main business priority for CIC-14 and CIC-1.

The Research Library is scanning all other LA reports produced prior to 1995 and converting them to PDF with Adobe Capture software. Thus these scanned files will have searchable text as do the electronically produced files.

A second effort of the LWW project is to make a connection to the PDF files through the Research Library's on-line catalog. A World Wide Web interface will be employed to access the on-line catalog. This connection will allow customers to obtain files through traditional author, LA-number, key word, or title searches, and then launch the PDF files at their desktop.

A third effort is underway to put 10 years' worth of the Science Citation Index on-line for desktop access to Laboratory staff. Abe Lederman of the Information Storage and Retrieval Group (CIC-15) is providing the major effort in developing a topic interface for this Index.

Jeane Strub, jstrub@lanl.gov, (505) 667-5809
Research Library (CIC-14)

Guidelines for LANL Home Pages

Because of its capability to reach mass audiences, the World Wide Web (the Web) is a tool the Laboratory must use to educate the public about its important work. The Laboratory's presence on the Web must project a level of competence and unity of purpose that matches its commitment to scientific excellence. LANL Web documents will reach many types of audiences, from technical specialists and managers to the general public. A unified, professional look is vital for the Laboratory's image as we market ourselves to the world.

The LANL Web Design Team

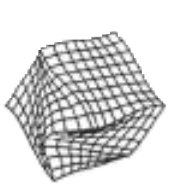
The merging of computer skills with "artistic" skills has come to the Internet, and while many people know how to write HTML, few are trained to understand the graphics technology or how to use this technology to effectively communicate with specific audiences. CIC-1 writers and designers are well-equipped to help Lab organizations accurately identify a variety of audiences and design their home pages to market themselves effectively.

The LANL Web design team, made up of CIC-1 writers and designers, will comply with recommendations of the Information Architecture project and provide the standards and specifications for the Laboratory's identification on the Web. This design team will make easy-to-use and cost-effective templates available to Laboratory groups who wish to design their own home pages. These templates will maintain a cohesive Laboratory look while allowing individual groups to add their own creativity and impact to their home pages.

To ensure the consistency of quality and design for the Laboratory's Web communications, please contact CIC-1 for assistance with your LANL home pages.

Questions and Comments

For assistance with your home pages, from templates to comprehensive custom design, contact CIC-1, 7-4636.
Or if you have any questions or comments: design@lanl.gov.



ICN Consultants Consult the Web

The ICN Consultants are often called the scavengers of information. But the truth is we do not always know the answers to the questions posed to us. However, we usually know where to find them. The World Wide Web (WWW) is quickly becoming a valuable tool that helps us locate answers to a multitude of questions about computer systems and software.

For example, the following are actual questions received by the consulting office. Is there a tutorial for the Common Graphics Systems (CGS)? How can a user check the status of a PAGES job? How do you set the output of gnuplot to PostScript? Is there a version of Netscape that takes advantage of SGI's fantastic graphics abilities? By using the Web, we were able to quickly retrieve answers for all of these questions.

For internal searches, we normally jump to the "Computing at LANL" page (http://www.lanl.gov/computer-information/). From there we can zip to information about most of CIC's groups. We also have the option of using LANL's search engine to look up a topic.

When we feel the answer lies outside of LANL, the first stop we usually make is at Yahoo (http://www.yahoo.com). Yahoo has a huge library of computing information including documentation, frequently asked questions (FAQs), tutorials, and free software. If that does not work we usually press the Net Search Button and type in our query. Answers usually pop up in seconds.

So, while you're out surfing, check out CIC's Customer Service Center. We're located at

http://www.lanl.gov/computer-information/cic6/CIC6.services.html

Or go to the LANL home page and look under "Services/Computing at LANL/CIC-6 Customer Service."

Before I forget, here are the answers to the questions mentioned above (more specific information can be found at the Web locations provided):

Q: Is there a tutorial for the Common Graphics Systems (CGS)?
A: Yes. You can access the tutorial at http://wwwc8.lanl.gov/graphics_vis/graphics_sw/cgs/cgs_tutorial.html

Q: How can a user check the status of a PAGES job?
A: PAGES provides an on-line form for checking job status. See http://pages-sv.lanl.gov/pages_status.html

Q: How do you set the output of gnuplot to PostScript?
A: Enter the command "set terminal postscript". See http://www.ns.utk.edu/gnu/ gnuplot/gnuplot_toc.html

Q: Is there a version of Netscape that takes advantage of SGI's fantastic graphics abilities?
A: Netscape version 1.1S is specially designed for SGI systems. You can download it for free at http://www.sgi.com/Products/WebFORCE/WebSpace/ WebSpaceDownload-for-SGI.html

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Customer Service Group (CIC-6)

Information Architecture Endorses World Wide Web, Calls for Phasing out Gopher Service

Among the suite of communications protocols that have been adopted as standards by the Information Architecture (IA) project, there are two that deal directly with how the Laboratory community accesses the Internet:

- TE-5606: Standard Hypertext Transfer Protocol (HTTP). This standard endorses HTTP version 1.0, which is the protocol at the foundation of the World Wide Web (WWW).

- TE-5609: Standard Gopher Protocol. This standard includes a call to phase out support for the Gopher protocol by January 1, 1996.

In essence, the standards call for supporting the WWW client software (browsers) instead of the Gopher client. This does not mean that servers currently running Gopher are expected to change. (WWW browsers can access Gopher servers.) Nor does it mean that the IA is "outlawing" Gopher clients. (If you still want to use one, you can, though we'd recommend it be in addition to, not instead of, a WWW browser.)

What the standards do mean is that Laboratory providers who choose to offer WWW service will not be expected to duplicate that service for Gopher. The central Laboratory Internet server, for instance, will be in alignment with the IA when it shuts down Gopher to focus on the WWW. The IA's own Internet site, which has previously split its attention in order to support both Gopher and the WWW, will likewise change to WWW-only support. And other Laboratory sites, many of which have never supported Gopher to begin with, will not be expected to change.

From one perspective, the standards can be seen as simply an acknowledgment of industry reality. Gopher revolutionized the Internet, but it has now been superseded by more advanced technologies.

According to the IA survey, however, a full third of the Laboratory community still uses Gopher. Some of these people use Gopher in addition to WWW browsers such as Mosaic or Netscape, and some have switched to WWW browsers since the survey was completed in March 1995. For others, though, there have been certain barriers to the transition, and the IA had to address those barriers before it could call for a Laboratory-wide transition.

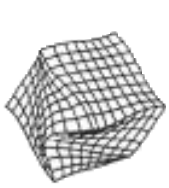
Barriers to the Transition

Barrier 1: Slow Serial Line Connections. The goal of the LANLnet project is to establish Ethernet connectivity to the Laboratory Internet throughout the Laboratory. Until that goal is a achieved, however, a number of Laboratory citizens can only access the Internet via modem. Early WWW browsers handled these slow connections poorly, and Gopher remained the only tool that offered reasonable performance.

This barrier has now been largely overcome. Client-side solutions (software that runs on your desktop machine) are based on improved WWW browsers. If your local machine is sufficiently robust (see the IA guidelines for hardware configurations), the newer Mosaic and Netscape products can display information as it arrives, instead of forcing you to wait for an entire file to be fully downloaded before anything is displayed. Additional speed can be obtained by turning off inline images, the data-intensive graphics that make the web a friendlier—but not necessarily more functional—place.

Server-side solutions are accessed via the same telnet connection used to reach Gopher. Programs like Lynx offer character-based access to the WWW, offering comparable performance to Gopher.

Barrier 2: Investment in Gopher Information Assets. A great deal of information on the Internet is still available only through the Gopher protocol. Fortunately, however, modern browsers understand the Gopher protocol and can access this information just as easily as Gopher itself. Indeed, modern browsers are integrated tools that combine access to hypertext (HTTP), Gopher sites, ftp sites, USENET newsgroups, and your own local hard disk.



Barrier 3: Preference for Gopher Structure. Gopher offers a clean, hierarchical structure that some users prefer, whereas a poorly designed WWW site can be a messy place. The solution here is arising from the growing number of WWW providers who have recognized the problem and are developing cleaner, more usable structures. At its best, a WWW site offers a logical, hierarchical structure in addition to more complex searches and cross links.

Barrier 4: "If it ain't broke, why fix it?" Gopher is still a functional tool that provides access to a number of sites the way it was intended to and that still has some new development occurring (e.g., TurboGopher). So why invest the time to change? The answer lies in the benefits outlined below.

Benefits of the Transition

Benefit 1: Increased Access to Information. There is already a great deal of information on the Internet, within and beyond the Laboratory, that can only be accessed via WWW browsers. Gopher users never see it, even though it is already there. Much of this information is directly applicable to the business of the Laboratory—such as DOE orders, the Administrative Manual, the National Performance Review, and more. Modern WWW browsers, meanwhile, still provide access to all the information currently served under Gopher.

Benefit 2: Reduced Duplication of Effort. In a situation where Gopher support has been a de facto requirement for anybody seeking to get information out to a truly Laboratory-wide audience, a number of information providers have been forced to duplicate their efforts, building something first in hypertext and again under flat ASCII. Not only does this require extra work, but it also leaves the providers knowing that they are offering Gopher users an inferior product, since the flat ASCII includes none of the links that enrich the content of hypertext versions. By phasing Gopher out, we hope to ease the transition to a more productive environment.

Benefit 3: Improved Connectivity. To the extent that the transition encourages the Laboratory community to adopt client-side solutions (Mosaic or Netscape), it also lays the groundwork for other improvements in computing and communications. Many people object to the archaic character-based interface to certain Laboratory applications; but until the connectivity is improved, every application that is truly Laboratory-wide in scope is forced to support the character-based interface, at least as an option. When a desktop system runs Mosaic or Netscape, however, then the connectivity has been established, communications protocols are in place, and the foundation has been laid for implementing client-server, graphical user interface (GUI) systems as they are developed.

Making the Transition

Although the IA has not endorsed any specific WWW browsers, there are three options that are easily available at the Laboratory (all support Windows, Macintosh OS, and UNIX):

- Commercial Browser: The Laboratory has a volume purchase agreement for Netscape Navigator ($20).
- Freeware Browser: The National Center for Supercomputing Applications (NCSA) offers its Mosaic browser free of charge. (Use the most current version, currently 2.0 final beta for Windows, 2.0 beta 12 for Macintosh, and version 2.6 for UNIX/X Window.)
- Character-Based Browser: To use Lynx, access gopher.lanl.gov via telnet, port 1664. (The actual command line will vary depending on your telnet program.)

For assistance in obtaining and installing Netscape or Mosaic, see the Desktop Group (CIC-2) Electronic Software Distribution page (under "Services/Computing at LANL/Electronic Software Distribution," or http://www-cic2.lanl.gov/esd/) or contact the CIC-2 Help Desk (7-HELP/7-4357). For assistance with Lynx, contact the CIC-8 Distributed Computing Team (www@lanl.gov).

For further information about the IA project, see our on-line materials. From the Laboratory internal home page, look under "Information by Subject/Information Architecture Project" (http://www.lanl.gov/projects/ia/) or contact Tad Lane (address below).

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Obtaining Software Electronically is Easier than Ever

Need to obtain, update, or register your copy of Netscape or Jet Form? What about MacSLIP or Acrobat Exchange? You can now use your Web browser to obtain these and other commercial software programs for which the Laboratory either holds a site license or volume purchase agreement.

The Electronic Software Distribution (ESD) system, created by the Desktop Group (CIC-2), was designed to make it easy for you to obtain these programs and more. To gain access to the ESD home page, point your Web browser at

http://www-cic2.lanl.gov/esd/

You can also access the ESD home page from the LANL home page by clicking on "Information by Subject/Electronic Software Distribution."

The ESD home page contains listings of available Macintosh, PC, and UNIX software. If you are a Macintosh user, you must first obtain a decompression program called Stuffit Expander before you can download software from the ESD system. You can obtain a copy of Stuffit Expander from the LANL FTP server (ftp.lanl.gov) or you can call 5–HELP (5–4357) and a copy will be e-mailed to you or sent to your mail stop on diskette, whichever you prefer.

To download a program, click on its link. A page appears describing the program features, cost, and system requirements. To download the software, click on the Register button. A page appears with two icons, one containing an unbroken key and the other containing a broken key. If you are using Netscape, you can conduct the transaction on a secure server by clicking on the unbroken key icon. If you don't have Netscape, click on the broken key icon. However, be aware that using the broken key icon means the transaction is not secure. A form appears asking for your ICN password or Smartcard PIN, the name and the e-mail address of the person to whom the software will be registered (it can be someone else besides yourself), and the cost and program code information. After filling in the form, click on the Send button. A page appears describing the methods you can use to obtain your copy of the software. In addition, you will be added to an electronic mailing list for future updates, upgrades, and useful information concerning the program.

To see a list of the software registered in your name, click on the "proof-of-registration" link on the ESD home page and enter your Z-number and either your ICN password or Smartcard PIN. For more information, contact Raven Zachary.

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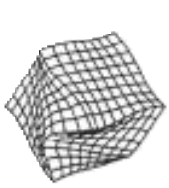
Desktop Group (CIC-2)



CIC-6 No Longer Offers Hard Copy Documentation

For many years CIC Division has operated a documentation center for users to obtain vendor and local computer documentation in hard copy form. Due to budget shortfalls, the Customer Service Group (CIC-6) regretfully announces that it must now eliminate this service as of October 1, 1995. This does not mean you can no longer get documentation. Vendor documentation can be purchased directly from the vendor. Please let us know if you need assistance contacting the appropriate vendor. Much of the local documentation we offered in hard copy is now available on-line through Explorer. (Explorer is a Web application developed by CIC-15 that integrates textual and graphical information with robust search and retrieval capabilities.) This on-line availability will enable you to access computer documentation in a quick and efficient manner. You can access Explorer from the LANL home page by clicking on "Information by Subject/Explorer" or enter the following URL:

http://iosun.lanl.gov:2001/explorer.html

Several useful documents like the "Network Services User Guide" and the "UNCOS at Los Alamos User Guide" can be accessed through Explorer's Systems Documentation page which is located at

http://iosun.lanl.gov:2001/htmls/infoSys/infoSys.html

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Customer Service Group (CIC-6)

BITS and the Web

BITS is on the Web in four different formats: ASCII, Adobe Acrobat (PDF), PostScript, and HTML. You can access these on-line versions with your Web browser by using the following URL:

http://www.lanl.gov/computer-information/ComputingNews/bits_homepage.html

This URL takes you to the BITS home page where you'll find general information about BITS and links to past and present issues. You can also access the BITS home page through the LANL home page by clicking on "Services/Computing at LANL/BITS: Computing & Communications News."

To receive notification when new issues of BITS become available on-line, subscribe to the BITS electronic distribution list. To subscribe follow these steps: (1) enter "listmanager@lanl.gov" at the "To" line in your e-mail message, (2) enter "subscribe bits-info" in the body, (3) enter "end" on the next line in the body, and (4) select Send. For more details about on-line BITS, refer to the articles "Welcome to On-Line BITS" in the May 1995 issue of BITS and "Distribution List for On-Line BITS" in the June 1995 issue.

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CIC-7 Production Control Team

The Production Control Team of CIC-7 manages a production and operations computing environment for the Laboratory to manage its administrative and business activities. Our responsibilities include running several hundred jobs to update, maintain, backup, and distribute current information. These jobs are executed on the IBM, VAX, SUN, and WANG LABWIDE administrative platforms.

Our goal is to run a business data center that reliably and efficiently provides our customers with business information that is updated daily. To accomplish this goal we work closely with the CIC-7 System Managers and CIC-13 application programmers to maintain production jobs, to maintain and enhance system performance, and to resolve production problems as quickly as possible. The Production Control Team works 24-hours per day, five days per week to provide timely support and to maintain current business information for the Laboratory.

The Production Control Team is also responsible for the daily production of many other business-related activities such as printing checks, business and financial reports, biweekly earnings statements, and monthly travel statements. Additionally, the Team stores current business information such as inventory and charge codes in the Common File System (CFS). This provides other Laboratory organizations with current business information that is readily available.

Our customers include other CIC groups and the budgetary and accounting teams within the Business Operations Division. The Team works closely with CIC-13 and BUS OPS during the Fiscal-Year-End process to execute the many special jobs that are necessary to close the Laboratory's books under extremely tight constraints. Our customers also include those who depend upon the availability of current Laboratory business information.

We have automated many of the production processes and will be improving and strengthening our skills and knowledge to provide better service and quality to our customers. For example, 99% of our IBM tape activity is handled within a StorageTek robotic SILO, similar to the CFS managed tape system. Please direct your questions and comments to our e-mail address, cic7-pc@lanl.gov.

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Applications Programming and the Human Genome Project Part 3: High-Resolution DNA Sequencing

As data automation and analysis increases and better sequencing techniques are developed, researchers involved in the Human Genome Project (HGP) are moving closer to their goal of sequencing the 50,000 to 100,000 genes in the human genome. Once researchers identify a gene sequence, it can be used to trace the biological effects of a gene mutation. These mutations contribute to the more than 3000 known inherited disorders such as Huntington's chorea, Alzheimer's disease, multiple sclerosis, and cystic fibrosis. Because gene sequences code for proteins, identification of a defective sequence helps scientists to unravel the biochemical pathways that lead to the symptoms of genetic diseases. Once this path is revealed, researchers can begin to develop drugs to cure or at least combat inherited illnesses.

Accelerating Sequencing Efforts

CIC-12 applications programmers are helping the Los Alamos HGP researchers scale-up for sequencing efforts that will be accelerated by several orders of magnitude, a goal known as megasequencing. As part of this effort, Elaine Best, Catherine Beauheim, and Gail Anderson have worked as part of a team including people from T-10 and LS-2 to develop four main sequencing applications:

- JAIME,
- BatchSequenceAnalysis,
- AutoMailHandler, and
- cDNA Inform.

JAIME

Developed by Elaine, Gail, Catherine, and Joe Gatewood (LS-2), JAIME serves as a sequencing data storage and analysis system for LANL researchers. JAIME provides a convenient interface for entering sequence data, or listings of DNA pairs within a chromosome segment, into the database. As data comes off the sequencing machines, cloning artifacts need to be identified and separated from the meaningful sequencing data. JAIME identifies most of these artifacts, and with the click of a mouse, users can mark the beginning and end of each artifact within the data. The DNA bases that makeup these artifacts are given a different color for each artifact type.

Using JAIME, researchers can analyze sequencing data to identify cloning artifacts, spot problems, edit sequences, compare sequences with other sequences, and decide whether to store data or redo the sequencing process. JAIME consists of a database (developed by Rob Pecherer of T-10), a graphical user interface (developed by Elaine and Joe Gatewood), and a context manager (developed by Gail and Catherine). The graphical user interface (GUI) enables researchers to interact with a user-friendly screen, retrieving data and analyzing it through simple selections and text input. The context manager, written in C, maintains interactions between the database and the GUI, written in GainMomentum. In addition, the context manager contains an algorithmic module (written by Elaine) that finds the cloning artifacts.

BatchSequenceAnalysis and AutoMailHandler

BatchSequenceAnalysis (BSA) was developed by Elaine Best, Joe Gatewood (LS-2), and Rob Pecherer (T-10); AutoMailHandler (AMH) was developed by Elaine Best. These two programs are part of an automated data analysis system designed to determine the function of DNA pieces.

There are a number of programs that analyze sequences, either by comparing the sequences whose function is unknown to sequences whose function is known or by looking for certain configurations in a sequence that suggest a particular function. Some of these sequence analysis programs run on computers belonging to the Center for Human Genome Studies while others must be accessed through an e-mail server. BSA and AMH do not perform any analysis themselves; rather, they invoke the analysis programs and then organize and store the results. BSA and AMH work together to automate the use of the sequence analysis programs.

BSA obtains selected sequences from local databases and then initiates the designated analysis methods process. For analysis codes that run locally, BSA launches the programs and then screens the output and stores the useful results in the local database. For analysis methods accessed by e-mail, BSA formats an e-mail query appropriate to the designated server. At this point AMH takes over, sending each query to the appropriate server and then checking incoming e-mail periodically for a response. The responses are screened and then stored in the local database. Because it is possible for e-mail to get lost, AMH keeps track of each query sent and verifies that the response has been received. If a response is not received after a set period, AMH sends a new query. If repeated queries fail, AMH reports the error to the users.

The data analysis system continues to be developed and expanded to include access to new analysis programs and to respond to changes in existing programs. HGP biologists continue to request changes in the methods used to screen results and in the preparation of sequences for analysis. In addition, HGP programmers plan to expand the data analysis system to include methods for improved organization and visualization of analyzed data.

cDNA-Inform

Developed by Mohamad Ijadi (CIC-8) and modified by Gail Anderson, cDNA-Inform is an international sequencing database that allows researchers to collaborate without the competition that has arisen in genetic research. Because gene sequences often hold the key to developing innovative drugs to treat genetic diseases, researchers have begun to patent important sequences. While these patents protect potential financial gains and academic recognition for individuals and their employers, they decrease collaboration among genetic researchers. This resulting loss of collaboration isolates researchers, decreases research productivity, and increases the possibility of redundant sequencing efforts. To combat this trend, cDNA-Inform was developed to preserve proprietary information while allowing researchers to know who, if anyone, is performing similar sequencing efforts. On the basis of this knowledge, researchers can decide to continue their work on a particular sequence, collaborate with others performing similar work, or move on to other sequences. cDNA-Inform works by taking sequences that a researcher inputs and searching its private database for other sequences that are similar. Each sequence submitted is added to the private database. The program notifies the researcher of any matching sequences and the degree of similarity. cDNA-Inform calls Blastga (an extension Joe Gatewood and Gail Anderson made to a publicly available sequence analysis program). Blastga uses complex analysis methods to determine levels of similarity between sequences and then provides both the researcher and the owner of the matching sequence with each other's name and e-mail address. User input is done by e-mail. An e-mail handler receives sequences to be submitted, validates the user by password, and runs cDNA-Inform.

Applications Programming

The Applications Programming Group (CIC-12) provides the Lab with short and long-term programming support that spans all platforms and technologies. CIC-12 services include software development; database design, development, and maintenance; basic research tools and programming support; graphics coding; data visualization; and applied supercomputing. For more information, contact Gary Clark at 665-4613.

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Follow up to "Applications Programming and the Human Genome Project Part 2"

GRAM (Genomic Restriction Map Assembly)

Developed by Cari Soderlund and Laurie McGavran, GRAM receives single digest data from a set of overlapping clones (identical copies of DNA fragments) and produces one or more partially ordered restriction maps along with the alignment of clones. Because of the error and uncertainty in the data, the exact solution cannot generally be calculated; therefore, GRAM provides interactive graphics so that the user can detect and fix the outstanding error. The GRAM editor allows the user to view the fragment's clone and to add, delete, and modify fragments. GRAM's Clone Manager allows the user to add and delete clones from the input set; it also has list processing capabilities so that subcontigs can be built and combined. Additional features allow the user to specify that two clones do or do not overlap, or that two fragments are or are not the same. The end fragments are ignored during initial assembly and display of a contig. However, the user can request that the end fragments be fitted to a contig.

The interface and underlying algorithms of GRAM have been extended for a marker assembly system called SAM, which Cari has continued to develop at The Sanger Centre, United Kingdom.

Brain Mapping: Applications Support for P-21's MEG-Based Brain Studies

The brain contains around 100 billion cells. Even seemingly simple tasks like moving your finger or looking at a word, engage hundreds of thousands of neurons in various parts of the nervous system. Neurons communicate with each other via chemical transmitters, which act to induce ionic currents within each active neuron. When many such individual currents are activated synchronously in space and time, these collective signals are large enough to be detected outside the head using one of a number of noninvasive brain-imaging techniques.

Using magnetoencephalography (MEG), researchers from LANL's P-21 Biophysics group are studying brain activity, particularly responses to given stimuli, by tracking the magnetic fields produced by active (high-current-producing) areas of the brain. In MEG research, the measurements of the magnetic field are made by a superconducting quantum interference device that is coupled to a gradiometer. Computer support is needed to visualize these data and to calculate the locations, strengths, and orientations of the neural currents.

There are a number of brain-scanning techniques, including MEG, positron emission tomography, functional magnetic resonance imaging, and electroencephalography. Each has its advantages. Among the benefits of MEG are good temporal resolution (on the order of milliseconds) and a level of noninvasiveness that does not require special injections or subjection to strong magnetic fields. With these benefits, however, comes the added challenge that the calculations to trace the location, orientation, and strength of small neural currents have solutions that are not unique. Helping address these problems, applications programmer Elaine Best (CIC-12) has provided four years of computer support to the project, including work on

- a boundary element code that addresses the mathematical challenges of MEG research,
- tools for data visualization and analysis, and
- a standardized file structure for data storage and retrieval.

Boundary Element Code for MEG-Based Studies

In LANL's MEG-based research, magnetic field data are used to determine the locations of the electrical sources in the brain by calculating what is known as the inverse problem. Unfortunately, the inverse problem cannot be calculated directly because the problem is ill-posed and underdetermined. Instead, researchers must combine a method to calculate the forward problem, or the magnetic field generated by a given set of electrical sources, with a fitting routine. The fitting routine does numerous calculations of the forward problem using the results of each forward calculation to generate a better estimate of the dipole locations, until the magnetic field calculated by the forward problem code closely matches the measured field.

To develop a more accurate calculation of the forward problem, Best worked as part of a team to modify a code that calculated the electric potential generated by a set of electrical sources. This pre-existing code was written by A. van Oosterom (a Dutch researcher). The newly developed code, called the Los Alamos Head Model (LAHEM), is a boundary element code able to use a mesh of a realistically shaped head. Previously the group used a less accurate method that relied on a spherical approximation to the head. Best has integrated LAHEM into two different codes that are used to calculate the inverse problem. LAHEM is also being used in stand-alone mode as a research tool for studying various questions such as the effect of various sensor-spacing schemes and the effectiveness of using alternate methods of calculating the forward problem.

In addition to developing the LAHEM code, the LAHEM team also had to develop a method of creating a realistic head model. Best developed a code to generate icosahedral-based meshes and project them onto a sphere. These spherical meshes were then used to verify the correctness of LAHEM by comparing the results of LAHEM's numerical solution with an analytic solution of the forward problem for the spherical case. Team member Doug Ranken (P-21) later took these spherical meshes and shrink-wrapped them to MRI data of the experiment subjects to create the realistic head-shaped meshes. (See Figure 1.)

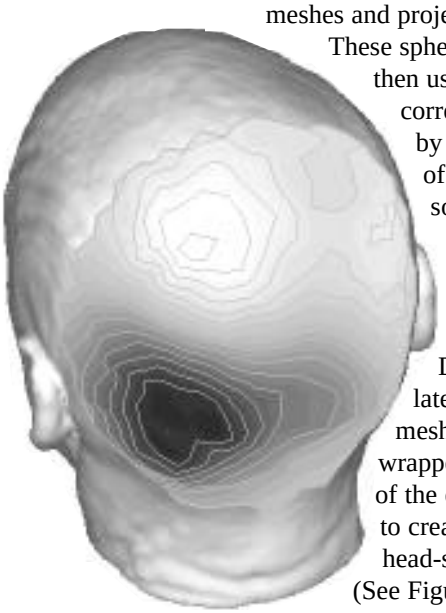


Figure 1.
Realistic head-shaped meshes used in the LAHEM boundary-element code. The figure shows meshes of MRI data "shrink-wrapped" onto the whole scalp, the outer skull, and the inner skull.

Tools for Data Preparation, Visualization, and Analysis

Because of the need to fit data to models and separate data from noise, quick data visualization is important to MEG researchers. Best has provided the team with a number of interactive data language, or IDL, visualization tools including MEGAN, SURF, and MONTE and WF.

MEGAN has several different plotting options. The waveform location plot (see Figure 2) shows the averaged waveforms corresponding to the magnetic fields plotted over time at each sensor location. Users can click on sensor location in this plot to delete bad sensors from the data or to choose waveforms to view in more detail. MEGAN also provides an enlarged plot of the averaged waveforms. By clicking in the waveform location plot, a user can choose specific waveforms and view them in detail. This allows comparison of activity at different sensors. MEGAN also plots field distributions (contour plots) at selected times.

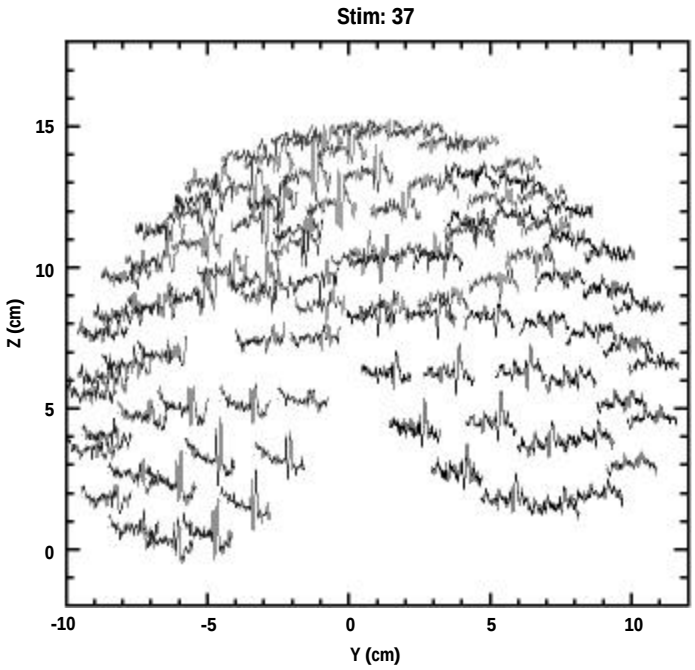
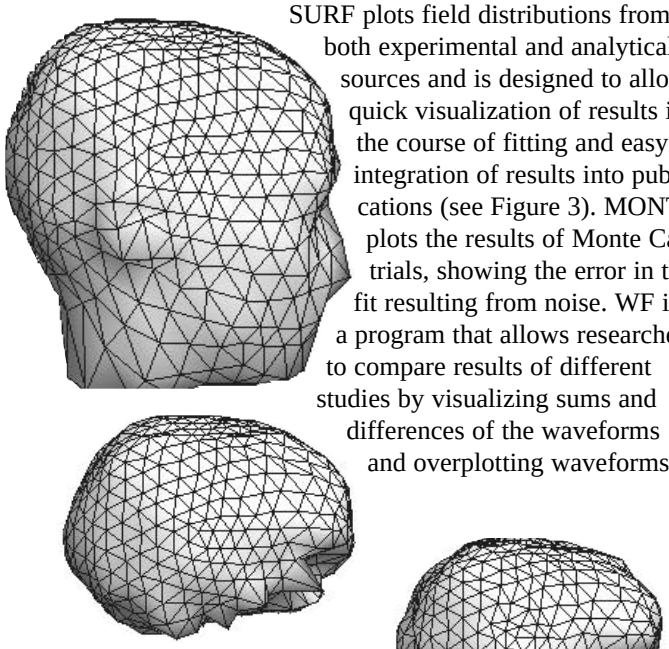


Figure 2.
MEGAN waveform location plot. This interactive visualization tool allows a user to delete data from bad sensors, look at specific data in more detail, and correlate data from different sensors at the same point in time.



SURF plots field distributions from both experimental and analytical sources and is designed to allow quick visualization of results in the course of fitting and easy integration of results into publications (see Figure 3). MONTE plots the results of Monte Carlo trials, showing the error in the fit resulting from noise. WF is a program that allows researchers to compare results of different studies by visualizing sums and differences of the waveforms and overplotting waveforms.

Figure 3.
SURF data displayed on an image of a head. Doug Ranken, P-21, wrapped the SURF plot of MEG data at a selected point in time onto a model of a subject's head.

Future Directions

In the future, P-21 will continue to make MEG analyses faster, easier to do, and more accurate. The two main goals of the MEG project are to learn about brain structure and function and to find ways of making MEG practical for use in clinical settings. Project members include Ed Flynn, Cheryl Aine, John George, Bob Kraus, Leon Heller, Hai-Wen Chen, David Schmidt, Doug Ranken, Wendy Tiee, Pat Ruminer, and Chris Wood.

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Condor: Application for Networking Workstations

LANL owns thousands of powerful workstations, which are connected via a local area network. Each of these powerful workstations is assigned to a single user. Generally, users can be categorized into three types: *casual users*, *sporadic users*, and *frustrated users*. Casual users are ones who utilize the machine's capacity to a minimum, probably to send/receive mail. Sporadic users are ones who use the machine's capacity to the fullest but for a short period of time. Last, we have the frustrated users, who demand more than what the machine's resources can provide. The needs of the frustrated user can be met by Condor.

What is Condor?

Condor is a software package, developed by the University of Wisconsin-Madison. It is a distributed batch processing system for UNIX workstations. Condor provides convenient access to otherwise unutilized workstations while maintaining the owner's priority on the machine. Condor works on a networked pool of workstations that are managed by a Condor *central manager*. Condor supports a homogeneous, as well as a heterogeneous, pool of workstations. Currently, Condor is supported on the following platforms: IBM R6000 running AIX, IBM RT/PC running AOS, Sun 3 and 4 workstations running SunOS, SGI running IRIX, HP 9000 under BSD UNIX, and Digital Equipment DECstation and VAXstation running ULTRIX.

How does Condor work?

Users can submit jobs to Condor from any workstation in the pool, provided the machine is registered in the Condor pool. A very neat feature of Condor is that a user's job can run on any machine in the pool. The user does not have to have an account on all the machines in the Condor pool. Once a job is submitted, Condor will find an idle machine in the pool and run the job on that machine until the owner regains control over that machine. An owner can reclaim his/her machine by hitting any key or activating the mouse. Another way control over the machine is returned is when the CPU load crosses some defined threshold. Once this level of activity is detected, Condor stops the running job and returns the machine to the owner. Thus, the owner of the machine has priority use of his/her workstation.

What Happens to a Stopped Job?

Condor takes care of the stopped job by providing a mechanism that allows the job to be checkpointed. Once the job is checkpointed, Condor keeps it queued on disk on the submitting workstation (job owner's machine) until another workstation in the pool becomes idle and available. On finding an idle workstation, Condor *migrates* (moves the job) to another machine and resumes the (stopped) job from where it left off. Thus, Condor guarantees that any submitted job will eventually be completed.

How is Condor Implemented?

A mechanism called *remote system calls* ensures that the file system and certain other machine characteristics appear identical on the *submitting machine* and on the *remote execution machine*. Remote system calls provide file access in an environment where there is no common file sharing mechanism (e.g., NFS, AFS). Condor provides its own method of independent file access by maintaining a process called *shadow*. Thus, Condor does not require a NFS (or similar) file system. Checkpointing and migration are done transparently in Condor; i.e., the user code does not have to accommodate checkpointing/migration. The user is totally unaware of these events taking place. Since checkpointing and migration are all done at user level, no changes are required to the operating system. For this reason, Condor is portable and can be used in environments where internals of the system cannot be accessed.

PVM and Condor?

Condor's ability to manage and schedule jobs on a large number of workstations makes it possible to run parallel applications as well. Condor supports parallel jobs, provided they do not communicate. A simple version of parallelism can be made possible if users submit the same job with different input values (files) or parameters. However, Condor does not support parallel applications that require communication or synchronization. At present, work is being done at the University of Wisconsin to allow Condor to support PVM (parallel virtual machine). It is expected to be out in the near future.

Are There Any Limitations to Condor?

Condor currently does not support applications that use signals, timers, memory-mapped files, or shared libraries. It does not support interprocess communication. Apart from the above, users have to link their binary with the Condor Checkpointing Library in order to perform checkpointing/migration.

Current Condor-Related Work at LANL?

Condor is currently installed at the Laboratory. The Condor pool presently consists of a few Sun workstations (homogeneous pool). The Parallel Distributed Tools team of CIC-8 has invited Miron Livny, one of the developers of Condor, from the University of Wisconsin to speak in Los Alamos on Friday, September 22, 1995.

Conclusions

Thus, it can be seen that the frustrated users have some hope! With their workstations in the Condor pool, they can run their long computation-intensive jobs on Condor and no longer have to feel frustrated over the limited resources of their workstations. It has been reported at the University of Wisconsin that Condor, since 1988, has served more than 144,000 jobs that have consumed more than 6,000 days of CPU time!

If you are interested in Condor and would like to register your workstation in the Condor pool, please send an e-mail message to the address given below.

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Distributed Computing Group (CIC-8)

Machine BETA Is Being Upgraded

To provide improved service and performance to our user community, we are changing the platform for machine beta on September 9, 1995. The beta machine will be upgraded from its current VAX/ULTRIX platform to the newer IBM RS6000-370 platform. The IBM system will be easier to maintain, more reliable, faster, and have equivalent disk space.

We plan to make this change as transparent to the user community as possible. We are thoroughly testing "new" beta to ensure that it will perform the same functions as "old" beta. We have also asked "friendly" users to help us test new beta before conversion. The new beta machine will maintain all of the news and mail utilities you have been using while providing an environment that should be faster and easier to use.

Because the architecture of the RS-6000 is different than that of the VAX, any compiled programs you have in your local directory will not run after the conversion. The change in platforms will necessitate the recompilation of all such code.

After the conversion, you will still log-on to machine beta but its network address will change. The new address for beta will be 128.165.1.160. A few utilities like Eudora and some terminal emulators save network addresses to use during log-on. Therefore, you must change the address in these utilities for them to function properly with the new machine.

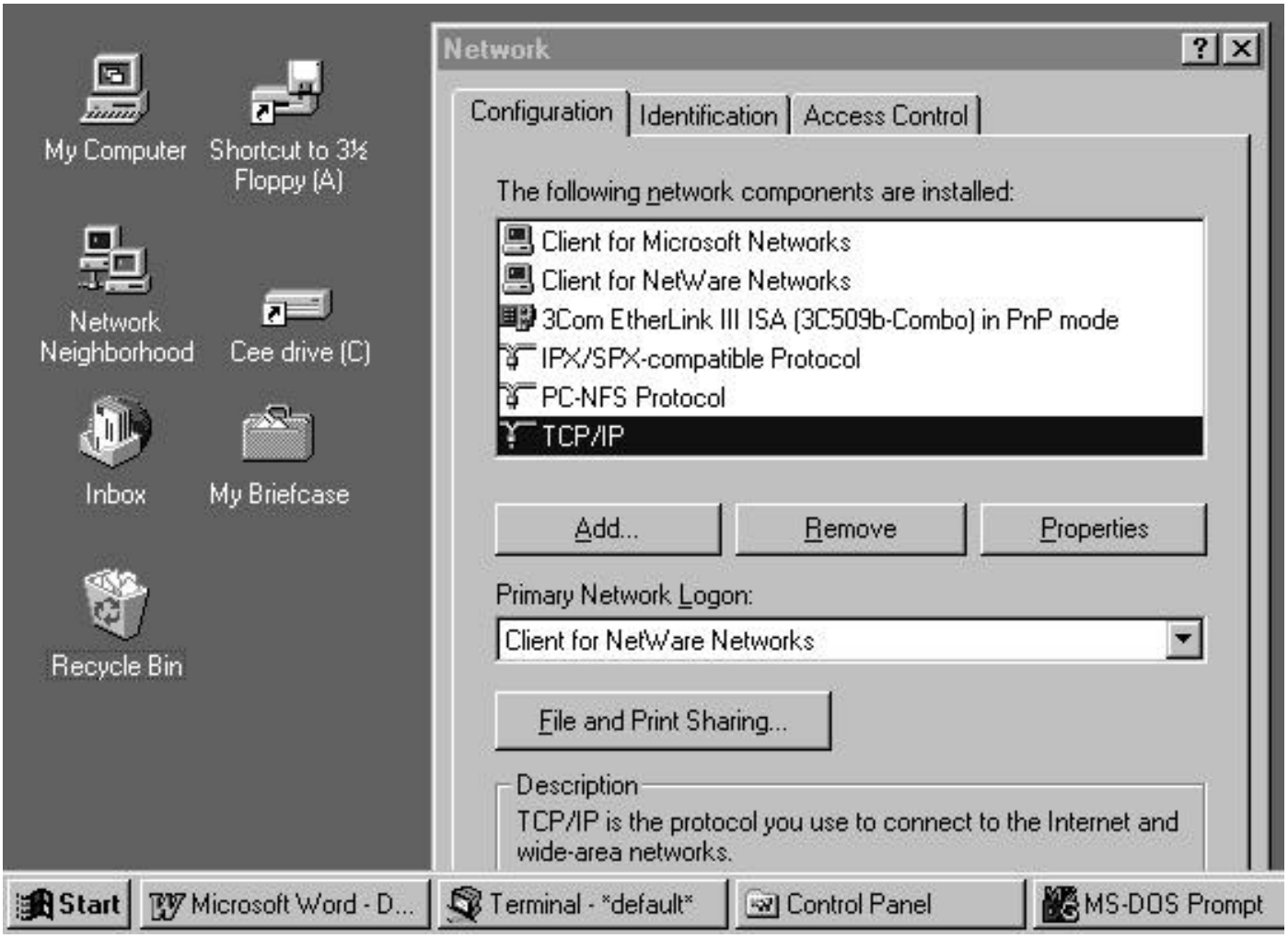
Additionally, if you are currently running NIS (network information services) with DNS (domain name system), your ICN address for old beta is located in the local /etc/hosts file. The local system will use this address rather than the address from DNS. Therefore, you must change the address in the /etc/hosts file on the local system for NIS to work properly.

One change that may be nontransparent to you involves the log-on procedure. The new beta will accept only your UNIX moniker during log-on; it will not accept your ICN user name (your Z# or assigned user number). If you don't know your moniker, you can obtain it by entering the command "whoami". If you have difficulty logging into new beta, please contact the ICN Consulting Office at 667-5745 or consult@lanl.gov.

As part of the conversion, we will be moving all of your files from old beta into new beta during the weekend of September 9. Consequently, beta will be unavailable for most of the day on Saturday, September 9. If you would like to try out the new IBM platform as a friendly user, please call me at 7-9847 or send e-mail to res@lanl.gov. If you have any questions or problems with machine beta at any time, please contact the ICN Consulting Office.

Bob Stewart, res@lanl.gov, (505) 667-9847
Computing Group (CIC-7)

Windows 95 Is Here



After several delays and much joking in the computer press, Microsoft Corporation will, in fact, release its new Windows 95 operating system on August 24, 1995. Windows 95 is Microsoft's new mainstream operating system that replaces Windows 3.1 and Windows for Workgroups 3.11. It features a new, more intuitive user interface; a "Plug and Play" support for peripherals; integrated, multiprotocol networking; right mouse button support; compatibility with Windows- and MS-DOS-based applications and hardware peripherals; as well as many other new features. This article will take a look at Windows 95 and how it compares with Windows NT.

The New Graphical User Interface

Microsoft learned some lessons from Apple Computer and updated its user interface. Gone are the Program Manager and File Manager. (Although they are available and can still be used.) There's a Windows Explorer application that serves as a new and improved File Manager, although you don't need to use it to access files anymore. On the desktop (see figure above) you have the default icons named My Computer, Network Neighborhood, Inbox, Recycle Bin, and My Briefcase. Double-clicking on the My Computer icon shows you the drives available on your computer. Double-clicking on the Network Neighborhood icon shows you what servers are available on your network—with no associated drive letters.

You are no longer limited to just program icons on the desktop. In addition to the icons mentioned above, you can create "shortcuts" similar to aliases on the Mac and links in UNIX. So, for example, you could create icons for your A: and C: drives and of important files and folders for easy access. When you view a window, you can choose between a Large Icon, Small Icon, List, or Details view. To close a window, you can still double-click in the top left corner, but the standard is now a set of motif-like minimize, maximize, and close boxes in the upper right corner of all windows.

Two new graphical user interface (GUI) innovations are the taskbar and the Start button. Both are always visible on the screen. (Although there is a taskbar auto-hide option which is useful for small monitors.) The taskbar shows all currently running applications and makes switching between multiple programs simple—just a single click. By default it lies on the bottom of the screen, but it can be moved to the top or sides. The Start button is reminiscent of the Mac's Apple menu and has settings for Programs, Documents, Settings, Find, Help, Run, and Shut Down. And the Start button and taskbar are always just a click away. (You can also press Ctrl-Esc to access the Start menu.)

Windows 95 finally makes good use of the right mouse button. The operating system and application programs (as they become Windows 95 savvy) add right button choices. Clicking the right mouse button brings up a floating menu at the point where the mouse pointer was pointing. Most of Windows 95's settings can be accessed by the right mouse button.

When you press Alt-Tab, Windows 95 shows you icons of all the applications that are running and which is next to be selected. (No more playing the Alt-Tab roulette.) And, you now have the option of using long filenames—up to 250 characters.

Other Improvements

Windows 95's networking options are greatly expanded, are easy to use, and can have multiple network clients and transport protocols running simultaneously. In the Network control panel, you have the option of adding Clients, Adapters, Protocols, and/or Services. Microsoft includes many protocols, including IPX, PPP support, and Winsock-compliant TCP/IP (with dynamic IP address assignment capability from an NT server). Additionally, there are many other third-party protocols, clients, etc., that are listed as install options. However, when you try to install a third-party product (such as PC-NFS), the installer will ask you for the appropriate installation disk.

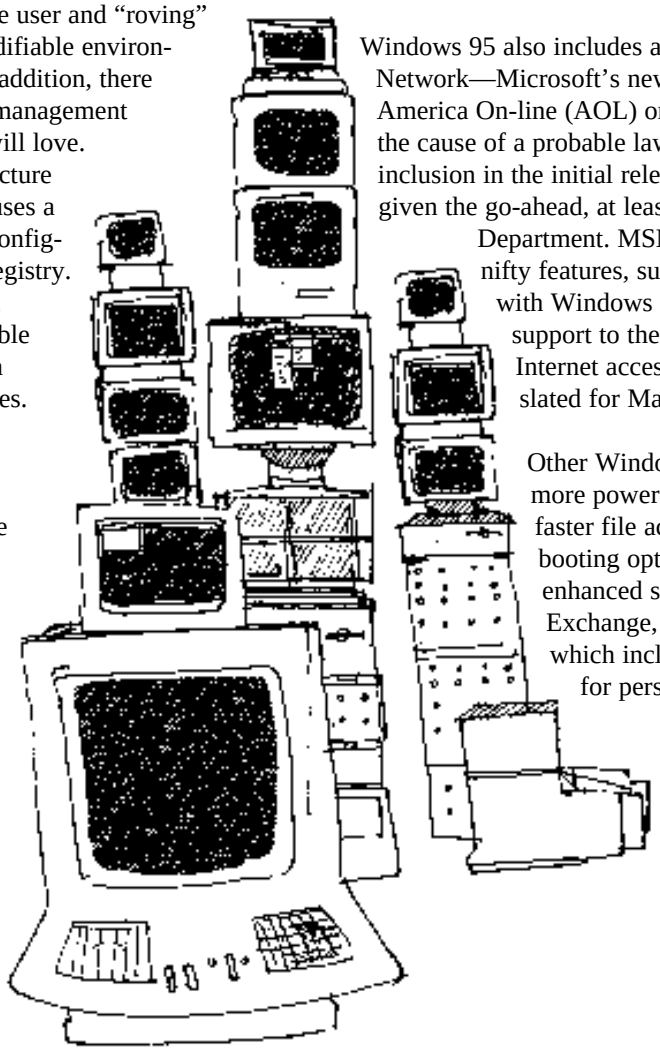
Microsoft supplies its own TCP/IP stack for Windows 95, and Winsock compliant clients (such as shareware ones) can be used with it. Windows 95 also has PPP software included, which can be used for remote TCP/IP connectivity. The Trumpet Winsock SLIP software (for which the Lab has a site license) can also be used. This has the added advantage of not requiring a reboot when switching between SLIP and Ethernet connections.

FTP Software, Inc. makes a suite of TCP/IP applications, which use their own TCP/IP stack, that are used extensively at the Lab. OnNet version 1.2 and PC/TCP version 3.1 are said to be able to work with Windows 95, although this is not supported by FTP Software. I have been told that this will only work if you do not install the Microsoft TCP/IP stack when installing Windows 95—installing Microsoft's TCP/IP's stack and then uninstalling it will not work. (Additionally, if you are using the NDIS network driver in Windows 95 you will need a patch called nd31.exe, available from their FTP site at ftp.ftp.com, in the /support/ftpsoft/onnet/v1.2/utils directory.) Your best bet, however, is to upgrade to OnNet for Windows 2.0 which will be fully Windows 95 and NT compatible and offers new Windows 95 features. This software will be available through the Lab's OnNet site license once a method for distributing this software is worked out.

Windows 95 is a 32-bit operating system that does not require MS-DOS. It provides virtual DOS shells that run in protected memory and use a "Windows 95 version 4.00" version of DOS. DOS applications will still have the 640 KB limitation inherent with DOS, but Windows applications don't and so will benefit from a much larger system heap, which significantly decreases problems with resource requirements. Newly written, 32-bit applications can use Windows 95's preemptive multitasking and multiple threads. Windows 95 now uses virtual 32-bit drivers (freeing up more conventional memory for DOS programs), as well as supporting old, real mode drivers. Each application in Windows 95 uses its own independent, asynchronous message queue so slower applications running in the background won't slow the system down. Over all, for systems with more than 4 MB of memory, performance will be improved over Windows 3.1.

Computers can now have multiple user and "roving" logins with independent user-modifiable environments and user-level security. In addition, there is now a whole slew of network management features that network managers will love. Windows 95 features an infrastructure for the management of PCs that uses a hierarchical database of system-configuration information, called the Registry. Configuring remote user lists and editing user environments to disable the MS-DOS prompt and the Run command are a couple of examples.

Ease of use will be improved through the Plug and Play architecture, which, as compatible hardware becomes available, will free users from manually setting up hardware devices. Windows 95 will detect and configure Plug and Play-compatible devices automatically. (A feature that will be greatly appreciated in the home market.)



Windows 95 includes bundled disk defragmentation, disk scanning and repair, disk compression, and backup software. (By the way, you should not use Windows 3.1 disk utility software with Windows 95.) Windows 95 does not include virus software, however, and, again, Windows 3.1 virus software is not completely compatible with Windows 95. Commercial virus detection software companies will all be releasing new software around August 24, 1995. McAfee also has available VirusScan for Windows 95 on the Internet for a free, 30 day trial (see ftp://www.mcafee.com/pub/antivirus/).

The WordPad application replaces the old Write and NotePad applications and adds support for the RTF file format. With the new autostart feature, when you put an audio CD into your computer, Windows 95's music CD player automatically launches. (Holding down the shift key when you insert a CD disables autostart.)

Windows 95 also includes a client for its Microsoft Network—Microsoft's new on-line service, similar to America On-line (AOL) or CompuServe. Although the cause of a probable lawsuit by AOL and others, its inclusion in the initial release of Windows 95 has been given the go-ahead, at least for now, by the Justice Department. MSN (as it is called) has many nifty features, such as seamless integration with Windows 95, including drag and drop support to the desktop. Direct, nonphone-line, Internet access to the Microsoft Network is slated for March of 1996.

Other Windows 95 improvements include more powerful features for laptop users, faster file access and printing, "safemode" booting options for troubleshooting, enhanced support multimedia, a Microsoft Exchange, universal inbox application which includes fax capability, and support for persons with disabilities.

Installation Tips

It is recommended (as it is always) to have all your important data files backed up before you install Windows 95. You should remove (or rem out) any unnecessary programs from your autoexec.bat and config.sys files and backup these two files to a diskette. And it is recommended to run a virus scan and ScanDisk or Chkdsk before running setup.

During installation, you should select the option of creating a boot diskette. You should also select the uninstall option which copies your important Windows 3.1 files to a hidden file and allows you to uninstall Windows 95 if you run into trouble. You should also select to install all the networking options you will need during the first install, rather than adding network options later.

More installation tips can be found in the Windows 95 "Frequently Asked Questions" readme file.

If you are on a network and have a Novell or Microsoft NT server, it is highly recommended to install Windows 95 off the server, rather than carrying around a CD or 22 (or so) floppies.

Miscellaneous Tips

You can add programs to the Start menu by dragging their icons to the Start button. If you hold down the Shift key when you close a window, it will close all your open windows. If you click on the taskbar and press Alt-m, it will minimize all your open windows.

If you hold down the F8 key when you see "Starting Windows 95..." on the first start up screen during boot, you will be presented with a list of boot options. You will have the options of various "safe modes" (which are useful for trouble-shooting), a step-by-step configuration mode, a logged mode, and if you installed Windows 95 into another directory other than your windows directory, you can boot from your previous version of Windows (dual-boot).

Windows 95 does not have a built-in diskcopy command. To create a shortcut for one, click the right mouse button where you want the shortcut, select *New ... Shortcut*, type *diskcopy a: a:* (or b: b:), and click *Next*, etc. Double-clicking the resulting icon will launch the DOS diskcopy command.

The Big Brother Registration Rumor

During the installation of Windows 95, if you have a modem connected to your computer, and only if you turn the on-line registration wizard on, you have the option of registering Windows 95 on-line. This feature has caused a great deal of bad press for Microsoft. It has inaccurately been reported that this feature will send to Microsoft a list of all your installed software, your data files, etc. This is not correct. If you select to perform an on-line registration, the setup program will record the hardware configuration of your computer and report that back to Microsoft. That information, when you think about it, is what is asked for on the registration postcard, anyway. This feature has been touted as a security risk. It is not. (The Justice Department reviewed these allegations and found them without merit.)

The Microsoft NT Question

Microsoft NT is Microsoft's heavy-duty, fully preemptive multitasking, hardware-platform-independent operating system. To me, its biggest claim to fame is its stability. For the most part, once it is installed, it will not crash. It is impressive. On the downside, it takes some serious hardware for good performance (See System Requirements below). It also provides C2 level security and symmetric multiprocessor support. It won't allow programs to access hardware, however, and thus does not provide the same level of DOS-compatibility that Windows 95 offers.

Sandia Labs has made the recommendation that if its computer users have powerful enough hardware and do not need extensive DOS compatibility, they should use Windows NT instead of Windows 95. Windows NT is intended as a business operating system. The Windows NT Server software (a different product from Windows NT Workstation) is becoming a standard for computer servers and, again, is very stable.

We have heard of users having trouble with "dual boot" configurations of DOS and NT and we don't recommend that you try to get the best of both worlds. If you are unsure about NT, make a full backup (and verify that it is good), so you can go back to the old DOS days if needed.

Windows NT does not yet offer Windows 95's new GUI. But, the new GUI will be offered in a future SUR (Shell Update Release). This should be released in the first quarter of 1996 and is rumored to be a free upgrade to current Windows NT Workstation users.

So, if you have hardware with enough oomph, can wait for the new GUI, don't use old DOS programs, and hate system crashes, consider using Windows NT. If you have a slower machine, need better DOS computability, and want the new ease of use, Windows 95 is for you.

System Requirements

To upgrade to Microsoft Windows 95, you need the following:

- Personal computer with a 386DX processor (486 recommended) running the MS-DOS operating system version 3.31 or later and Microsoft Windows version 3.0 or later or OS/2 version 2.0 or later,
- 4 MB of memory (8 to 12 MB recommended),
- Typical available hard disk space required: 35-40 MB (a full installation can take up to 60 MB of disk space),
- One 3.5" high-density disk drive or CD-ROM drive, and
- VGA or higher-resolution graphics card.

The Lab's upgrade cost (diskette or CD) will be $90.30.

To upgrade to Windows NT Workstation, you need the following:

- Personal computer with a 486 processor (33 MHz minimum, 66 MHz recommended),
- 12 MB of memory (24 MB recommended),
- Typical available hard disk space required: 50 MB (a full installation can take up to 80-90 MB of disk space),
- One 3.5" high-density disk drive or CD-ROM drive (CD-ROM strongly recommended), and
- VGA or higher-resolution graphics card.

The Lab's upgrade cost is $98.00.

There is a list of hardware on the Internet at http://www.microsoft.com/BackOffice/ntserver/hcl/nts14200.html that Microsoft has tested with Windows NT. If your hardware is not on this list, it may work, but then again it might not work. Our advice is to try it; if it doesn't work, whether because of an incompatible network card or graphics adapter, etc., get a new one that is on the list.

Conclusions

Being a Macintosh user, I have to say I'm impressed with Windows 95. The Windows interface is becoming more like a Mac all the time. In fact, some aspects of Windows 95, such as the taskbar, are even more intuitive than the Mac's current user interface. However, other aspects of the Window 95's GUI still lag behind the Mac's. (The Mac also has a major advantage with its high level of hardware and software integration and still leads in the multimedia arena.)

I have found Windows 95 to be reasonably stable as well. Although it has gone through extensive beta testing, remember, however, Windows 95 is a new product and there will be some problems with certain system configurations. There will also be maintenance releases. Because of this, some people will wait on Windows 95. However, someone I work with has used Windows 95 on a production system since the first beta release about a year ago without many problems. This speaks very highly of Windows 95's stability and maturity. Finally, there is also the question of whether to use Windows NT instead.

All in all, I have been impressed with Windows 95 and find its ease of use and productivity much improved. I don't believe Macintosh users will be swayed to switch, but Windows 3.1 users will love it.

Windows 95 is available for a test drive in the CIC-2 demo room (TA-3, SM-30, room W124). Also check out Microsoft's Web site at http://www.microsoft.com. For questions or help with Windows 95, call the CIC-2 PC software support line at 7-5884.

John Layne, jpl@lanl.gov
Desktop Group (CIC-2)

TN 3270 for the Macintosh: Time Entry for Contract Employees

To enter electronic time sheet data for technical contract employees, users needed a program that would run on a Macintosh, was easy to use, and was inexpensive. TN 3270, a freeware program that emulates an IBM 3270 terminal, was chosen by the Desktop Group (CIC-2) as a simple solution for entering time sheet data into the Secretarial/Contract Services System on the Lab-Wide System.

TN 3270 Features

Even though the TN 3270 program is freeware, it has many useful features including the following:

- Fully mapped function keys to the Macintosh keyboard,
- Recognition of mouse movements as an alternative to the Tab key, and
- Color graphics.

In addition, CIC-2 has created a document that you can double-click to connect directly to the IB system.

Hardware and Software Requirements

TN 3270 will run on any Macintosh with at least 500k of available RAM and 700k of available disk space. In addition, the Macintosh must have MacTCP installed and be connected to the Laboratory network via Micom, ISDN, SLIP, or Ethernet.

Obtaining the TN 3270 Application

You can obtain TN 3270 by pointing your Web browser (such as Netscape or Mosaic) at

http://www-cic2.lanl.gov/esd/

If you don't have a Web browser, you can obtain a copy on diskette or by e-mail by calling 5–HELP (5–4357).

Installing and Using TN 3270

In most cases, your browser will start the helper application needed to decompress the file. However, if you need to decompress the TN 3270 application manually, double-click on the tn3270 2.4a7.sea icon and follow the instructions that appear on the screen. You will be prompted to select the location where you want to install the software. After you select the location, the installer decompresses the software and documentation and places it in a folder called tn3270 2.4a7 on your hard drive.

To connect to the IB system, open the folder and double-click the IB icon. The TN 3270 application starts and the IB log-on screen appears.

You can obtain help logging into the IB system, along with a quick reference guide, by calling Contract Staffing Services at 7–2955 or Lab-Wide Systems Support at 7–9444.

Raven Zachary, raven@lanl.gov, (505) 667-4545
Desktop Group (CIC-2)

LANL Research Library Training

The LANL Research Library provides training for using its specialized databases. Training sessions begin at times indicated below. Classes are scheduled for half an hour, except for "Information Resources on the Internet via WWW" which is two hours. Space is limited to 8 per session. Classes are free, but you must pre-register by calling the Research Desk at 7-5809 or sending e-mail to ref@lanl.gov. Special classes and orientations can also be arranged.

Date	(Time)	Subject Matter
9-7-95	(10:00 a.m.)	Information Sources on the Internet via WWW
9-7-95	(1:00 p.m.)	Commercialization Information for Patent Applications
9-12-95	(1:00 p.m.)	Science Citation Index
9-14-95	(2:00 p.m.)	Information Sources on the Internet via WWW
9-19-95	(1:00 p.m.)	Chemical Abstracts, selected portions
9-20-95	(11:00 a.m.)	MELVYL (University of California databases)
9-21-95	(10:00 a.m.)	Information Sources on the Internet via WWW
9-28-95	(2:00 p.m.)	Information Sources on the Internet via WWW

Lab-Wide Systems Training

The Customer Service Group (CIC-6) offers training for users of Laboratory information systems. The CIC-6 courses offer training for a variety of personnel including property administrators, group secretaries, training coordinators, budget analysts, group leaders, or anyone needing to access training records, property records, costs, employee information, travel, chemical inventories, etc. Refer to the table below and on the following pages for specific information about courses currently offered.

Course Registration

You must have a valid "A" or "U" level ICN password before taking any of the courses shown in the table. To register for a course, call CIC-6 Training, Development, and Coordination section at 667-9444 or send E-mail to classes@lanl.gov. You will be sent a registration form to be completed and returned.

Course Title	Date	Time	Cost	Course Number
ALL-IN-ONE Basic Electronic Messaging	**Scheduled Upon Request**		**$410**	**Course #6882**
	Participants receive hands-on instruction to create, read, and print electronic mail. Participants also learn how to edit mail, create distribution lists, send mail to a FAX machine, and grant mail access to others. Prerequisite: an ICN password and an account on the OFVAX.			
Automated Chemical Inventory System (ACIS):	**Scheduled Upon Request**		**$410**	**Course #7480**
	Participants receive hands-on instruction to update the status (end-user,location, quantity) of chemical containers. Participants will also learn to generate chemical inventory reports by chemical name, end-user, location, and organization.			
Budget Computing System (BUCS):	**Scheduled Upon Request**		**$410**	**Course #3527**
	This training is an introduction to the Budget Computing System (BUCS). Students practice generating "quick reports" and reports requiring parameter files. An introduction and demonstration of (no "hands-on") allocating and forecasting procedures are given during the three-hour session.			
Directory Information System (DIS):	**Scheduled Upon Request**		**$410**	**Course #7072**
	Lab-wide customers responsible for maintaining the Laboratory directory in the Employee Information System will receive hands-on instruction to update Laboratory employees, update and add non-Laboratory employees, retrieve location and address information for any employee, and print reports.			
Employee Development System - Basic Training (EDS I):	**9/6/95**	**8:30 – 12:00**	**$410**	**Course #5289**
	The course provides hands-on instruction to request course enrollment, use the on-line course catalog, retrieve training transcripts, and assign EDS authorities. The student will learn to create courses, add students to the courses, and generate several training reports.			
Employee Development System - Training Plans (EDS II):	**9/20/95**	**8:30 – 12:00**	**$410**	**Course #7155**
	Participants receive hands-on instruction to create and maintain training plans, assign assignment codes, and generate training plan reports. Attendees must have prior training in the Employee Development System (course #5289).			
Eudora Electronic Mail	**10/26/95**	**8:30 – 10:30**	**$205**	**Course #9762**
	This class is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.			

Course Title	Date	Time	Cost	Course Number
Facilities Project Information/Work Orders (FPI/WO):	**Scheduled Upon Request**		**$410**	**Course #6996**
	Lab-wide users with a need to view the status of work orders and tickets in their organizations will receive hands-on instruction to request, print, and review work order, ticket and project summary information reports.			
Financial Management Information System (FMIS):	**Scheduled Upon Request**		**$410**	**Course #8338**
	Participants receive hands-on instruction to "explode" and "transfer" through the costs, allocations, and outstanding commitments screens. In addition, participants will create/review reports, access the Information Manager Utility for printing reports, and learn how to assign authorities in the system.			
Hazardous Materials Transfer Tracking System for Nonradioactive Material (HMTTS/NRAM):	**Scheduled upon request**		**$410**	**Course # 7907**
	Participants receive hands-on instruction to create, update, and print the non-RAM Hazardous Materials Transfer Form (HMTF). Attendees must have completed "Completing the HMTF for Non-RAM," course #7512, sponsored by HS-8.			
Hazardous Materials Transfer Tracking System for Radioactive Material (HMTTS/RAM):	**Scheduled Upon Request**		**$410**	**Course #7993**
	Participants receive hands-on instruction to create, update, and print the Radioactive Materials Transfer Form (RMTF). Information about the non-RAM Hazardous Materials Transfer Form (HMTF) is included. This course is appropriate for people who fill out both RAM and Non-RAM forms. Attendees must have completed "Completing the RMTF," course #7517, sponsored by HS-8.			
Introduction to the Internet: Beginning Netscape	**10/18/95**	**8:30 – 10:30**	**$205**	**Course #10961**
	Students gain basic understanding of the Internet and the World Wide Web and the use of Netscape as a browser to surf the Net. Topics covered are both Laboratory sites and open sites, along with practical uses of the Internet.			
Introduction to LANL Information Systems	**9/8/95**	**8:30 – 11:30**	**Free**	**Course #10118**
	This three-hour class is a hands-on introduction to the information systems available to Laboratory-wide users. The participants will become acquainted with Lab-wide information systems such as TRIPS and Stores, Electronic Mail, and Netscape (an interface to Laboratory information).			
Key/Core System	**10/24/95**	**8:30 – 10:30**	**$205**	**Course #10179**
	Key custodians and alternate key custodians receive hands-on instruction to add, update, and delete key and padlock information, and view assignment information and request reports. Students will also learn how to request key inventory notifications. Students must be a key custodian or alternate and have an ICN password.			
Lotus Notes Basic Concepts	**Scheduled Upon Request**		**$410**	**Course #9917**
	This class provides hands-on instruction for Mac and PC users to use Lotus Notes software to create and send E-mail memos; fax documents; search databases; create filters, nicknames, banners, and doclinks; set defaults; and use multiple address books. In addition, participants learn how to use the memo, meetings, and discussion databases.			
On-Line Forms	**9/26/95**	**1:30–5:00**	**$410**	**Course #9756**
	Participants will learn to use Netscape software to access Lab-wide information and forms. Using Jetform Filler software, participants will access, complete, and print forms such as the "ICN Validation Request," "Visitor Request for Unclassified Visits to Security Areas," and "Request for Quotation."			

Course Title	Date	Time	Cost	Course Number
Property Accounting, Inventory, and Reporting System (Advanced)	**Scheduled upon request**		**$410**	**Course #9918**
	This course will include a refresher of PAIRS, advanced techniques and tips, explanation of the notification system, and report capabilities. Swap Shop, Loan Out information, and support tables will be discusses. Participants should already have a basic understanding of and know how to use PAIRS.			
Secretarial/Contract Services (SE):	**Scheduled upon request**		**$410**	**Course #7481**
	This class provides hands-on instruction for creating secretarial requests for temporary services, entering time for technical and nontechnical contract employees, and creating reports using the Information Manager Utility. The students will also learn how to review notifications and approve attendance. A training database will be used for the class.			
Signature Authority System (SAS):	**9/14/95**	**8:30 – 12:00**	**Free**	**Course #7582**
	Managers or their designees receive instruction to assign, view, and change signature authorities (purchase request, chemical purchase, and handling hazardous material). Participants will also learn how to generate and print authority reports for their organizations.			
STORES:	**Scheduled upon request**		**$410**	**Course #3529**
	Participants receive hands-on instruction to search for an item in the on-line catalog by key word, part number, or exact name. Participants learn how to select items from the catalog, and place, change and cancel an order. Several methods for reviewing orders are also taught including reviewing an order in detail, scanning all orders, and reviewing back-orders.			
Time and Effort System	**Several September dates available**		**Free**	**Course #11018**
	The student will learn how to enter attendance, amend attendance, approve attendance, and submit exception and approval reports. Time codes and associated policies will also be discussed. In addition, the student will learn how to use the Information Manager utility to view and print reports.			
Travel Reporting Information Planning System (TRIPS):	**Scheduled upon request**		**$410**	**Course #4369**
	Class participants receive hands-on instruction to prepare travel requests (TRs) on-line and learn the print, revise, and cancel options. The participants also learn how to use the on-line approval function. The various reports available in TRIPS-II are reviewed.			

CIC Computing Classes

CIC offers a variety of computing courses for the professional development of Laboratory employees. The courses listed in Table 1 will meet at the time and the date shown. The date for courses in Table 2 are not known at this time.

Course Registration

To register: (1) check the box beside the appropriate course, (2) complete the Enrollment Information section below, and (3) follow the mailing instructions on the back of this form. Submittal of a Course Registration form does not guarantee participation in an advertised class, but it is the only way to get into the queue for notification of upcoming classes. Classes are conducted in a secure area unless noted; uncleared participants require escorts. Call the Training Coordinator at 667-9399 for more information.

Table 1 Courses with confirmed time and date

	COURSE TITLE	INSTRUCTOR	COST	DATES
☐	UNIX (Beginning)	Ted Spitzmiller & Jeffrey Johnson	$810	9/11/95 through 9/15/95

Table 2 Courses with date to be arranged (TBA)

	COURSE TITLE	INSTRUCTOR	COST	DATES
☐	C Programming (Beginning)	Boulder Software Group	$1025-$1450 (depending on enrollment)	TBA (5-day class)
☐	C Programming (Advanced)	Boulder Software Group	$1025-$1450 (depending on enrollment)	TBA (5-day class)
☐	SUN Solaris 1.X (SunOS 4.X) Advanced System Administration	Sun Microsystems Expert	$1750-$2000 (depending on enrollment)	TBA (4.5-day class)
☐	SUN Solaris 2.X System Administration	Sun Microsystems Expert	$1750-$2000 (depending on enrollment)	TBA (5-day class)
☐	Unigraphics	Polster CAD/CAM Services or comparable expert	$1067.67–$1250.00 (depending on enrollment)	TBA

Note: Detailed course descriptions for most classes provided on the following pages.

cut along dashed line

Enrollment Information

Name _____

Phone _____ Z-Number _____

Group _____ Mail Stop _____

Program Code* _____ Cost Code* _____

Group Leader Signature _____

****Enter program code and cost code for all courses. If you need to withdraw from a class fewer than 5 working days before the class is scheduled to begin, your group will still be charged. Substitutes may be sent, but please let the CIC Division Training, Development, and Coordination Office (667-9399) know who your substitute will be.***

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CIC DIVISION TRAINING DEVELOPMENT
AND COORDINATION TEAM
LOS ALAMOS NATIONAL LABORATORY
PO BOX 1663
LOS ALAMOS NM 87544-9916

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C Programming (Beginning)

Prerequisite: An understanding of the useful skills in a high-level programming language.
A current ICN password is required.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10, Maximum 16.

Topics: Introduction and Fundamentals; Basic Semantic Constructs—Getting Started; Base Level I/O with C; The Preprocess-Compilation Environment; Operators, Data Types, and Storage Classes; Control Flow Constructs; Conditional Constructs; Higher-Level Data Constructs in C; File I/O; UNIX Software Tools; and POSIX System Calls.

C Programming (Advanced)

Prerequisite: Useful skills and experience with the C Programming language.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10, Maximum 16.

Topics: Data Structures, Algorithms, and OOP; An Advanced Clinic for C Programmers; The ANSI C Recommendation X3.159; C and ANSI C War Stories; The Data Structure and the Assessment of Algorithms; Arrays; Structures; Unions; Stacks; Queues; Linked Lists; Recursive Functions; Binary Trees; Hashing; File Organizations Using the C Runtime Library; Standard Interprocess Communication Mechanisms; An Introduction and Overview of AT&T's C++ 3.0; and Appendix: references for periodicals, journals and texts.

Unigraphics

Prerequisite: Drafting terminology and skills, do not need to know Unigraphics CAD/CAM but must be familiar with CAD/CAM concepts.

Location: CIC-CTI Classroom; TA-3, SM-200, Room 115.

Enrollment: Minimum 10, Maximum 16.

Audience: Engineers, technicians, and draftspersons who must work with CAD/CAM CAE systems to be able to share and modify information efficiently.

Topics Include: Getting Started; Features & Operations; Lines; Arcs & Circles; Edit Curve; Fillet & Chamfer; View; Layout; WCS; Layer; Swept Feature & Operations; Info; Form Features; Transform; More Curve Creation & Object Display; Edit Feature; Overview of Sketches; Preferences; Sketch; Sketch Curves; Constraining Sketches; Swept Features Using Sketches; Editing Sketch; and Assemblies.

UNIX (Beginning)

Prerequisite: Familiarity with a UNIX workstation.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 8, Maximum 10.

Topics: Overview of the Workstation environment; Getting Started; The UNIX File System; Manipulating Files; Customizing Your Environment; The C-Shell; Editing and Writing with vi; Using the Network; Discussing NFS and NIS; Using basic system status commands; Startup and shutdown procedures; Using tar.

Beginning UNIX—This course has been restructured to address generic UNIX information. There is no longer a focus on Sun operating systems and tools. Additional topics are being added. This course will probably be offered on a quarterly basis.

Advanced Computing Laboratory

When first founded, the Advanced Computing Laboratory (ACL) was intended to provide an applications-driven environment for developing leading edge computing technologies, primarily in the areas of parallel and distributed computing, scientific visualization, and high-speed networking.

In December 1991, Los Alamos National Laboratory was named as one of two national HPCRC (High-Performance Computing Research Center) sites by the Department of Energy's HPCC (high-performance computing and communications) program. The ACL is the foundation upon which this center is being built. The mission of the ACL is to facilitate solution of tomorrow's complex, interdisciplinary problems in science, industry, and defense. This will be accomplished by focusing on a few Grand Challenge-scale applications, providing a unique simulation environment and advanced computational resources, having a world-class staff, and forging links with other centers of excellence.

The resources of the ACL are available to LANL employees with a demonstrated need for the unique resources that the ACL provides. In addition, industrial collaborators may seek access through a partnership with the Laboratory, which can be arranged through the Computational Testbed for Industry (CTI). Under the auspices of the DOE Grand Challenge program, other external researchers involved in the LANL-based Grand Challenge projects may also seek access. An ACL account application form is available by sending e-mail to **proposal@acl.lanl.gov.** The only payment the ACL requests for use of its resources is a copy of any paper or other publication with ACL acknowledgment in the publication.

ACL Machine Availability

Machine Type	Operating System	Security Partition	Machine Name(s)
SGI ONYX	IRIX 5.3	Open	black
SGI ONYX	IRIX 6.1	Open	wort
SGI 380VGX	IRIX 5.3	Open	panda
IBM 590*	AIX 3.2.5	Open	acti
IBM 590*	AIX 3.2.5	Open	telemed
Thinking Machines Corp. Connection Machine CM-5*	SunOS	Open	cm5-1 to cm5-8
CRI T3D*	UNICOS 80	Open	T3D
Sun 4/670	SunOS	Open	koala
Sun 4/670	SunOS	Open	cocker
Sun 4/670	SunOS	Open	collie
Sun 4/670	SunOS	Open	pooh

* Special access rules apply.

ICNchanges Contents

Change Control for September 1995

Schedule for Change Control

Date	Activity
September 5 (First Tuesday)	New or changed software is available in experimental (**X**) files on CFS for testing. This initial testing period is for uncovering problems in the software before the software is put into production. If you find a problem, please call the ICN Consulting Office at (505) 667-5746.
September 12 (Second Tuesday)	The changes become production version on • Machine **rho** (UNICOS) • Distributed processor **beta** (ULTRIX → AIX) • Distributed processor **ccvax** (VMS)
September 19 (Third Tuesday)	If no problems are reported to the ICN Consulting Office (505) 667-5746, changes are installed on • Machine **gamma** (UNICOS)
STOP	The Department of Energy (DoE) has frozen software changes to the machines in the secure network. **X** files and executables will be placed on CFS as usual and users are encouraged to test these files. Executables will be installed in a staggered fashion when the freeze is lifted. The date for lifting the freeze is unknown. • Machines **delta**, **epsilon**, **tau**, and **zeta**

Note: A stop sign in front of a title is significant:

STOP **= incompatible changes; please read!**

Changes

Stop CFS

Function

Network archival and file storage server.

Change

A new version of the CFS command will be installed on the open UNICOS Machines Rho and Gamma, September 1995. For a detailed description of the changes included in this new version see the ICNchanges article "CFS Gateway" in the August 1995 *BITS*.

WHATLIB (UNICOS)

Function

Searches a certain data file for the name(s) of libraries with which one or more entry point or common block names is associated.

Change

WHATLIB itself has not changed, but the data file it searches (**/usr/local/data/nilibs**) has been updated on Machines Gamma and Rho (only) to reflect the complement of libraries associated with UNICOS 8.0.

X File Access

No experimental (X) files
New version available as per the Change Control Schedule.

Online Documentation

To display the man page (dated 5/94), enter: **man whatlib**
To display the built-in help package, enter: **whatlib -h**

System Information

This section provides information and a record of changes to the ICN operating systems. When changes are announced here, they may already be included in the production versions of the indicated operating systems and machines. Most of the changes are strictly internal to the systems and should not affect users. However, if you detect a problem, please call the ICN Consulting Office at (505) 667-5746, or send electronic mail to **consult@lanl.gov.**

Stop Machine Beta (ULTRIX → AIX)

On September 9, 1995 Machine Beta will be upgraded to an IBM RS6000-370; we are currently running on a VAX/ULTRIX system. This upgrade will provide improved service and performance to our user community. The IBM platform will be easier to maintain, more reliable, faster, and have equivalent disk space.

We plan to make this change as transparent to the user community as possible. We are testing the new system thoroughly to ensure that it will carry out the same functions as the current system. We have also asked "friendly" users to help us test the new system before the conversion. Machine Beta will have all the news and mail utilities that you have been using, and should be faster and easier to use.

Stop Machine Beta (contd.)

- Because of the changes in the architecture, all compiled programs that you have running in your local directory will need to be recompiled.
- The network address will be changed to 128.165.1.160. After the transition, you will still be logging in to Machine "BETA."
- We will be moving all your files onto the new machine during the weekend of September 9, 1995. Machine Beta will not be available for most of the day on Saturday, September 9, 1995. If you would like to be considered for "friendly" user status, please call Bob Stewart (CIC-7) at (505) 667-9847, or send e-mail to **res@lanl.gov**.

Stop Machine Delta (UNICOS)

On September 17, 1995 at 8:00 a.m., Machine Delta will be upgraded to UNICOS 8.0. Some user codes from the 7.0 environment will run ok under UNICOS 8.0. However, codes that use CFTLIB or other system-related libraries or features should be recompiled and reloaded in the new environment. Users should pay close attention to news items posted on Machine Delta for further updates to the conversion schedule.

Documentation

New and Updated Man Pages

The following online information has been added or updated.

UNICOS Man Pages

To access a UNICOS man page, enter: **man** *command_name*, where *command_name* is the name of the command, library, routine, or utility whose man page you wish to view.

Man Page	Description
support	This is an index of software that is obtained from third party vendors and is made available on ULTRIX → AIX, UNICOS, or UNIX systems in the ICN. This software is not supported by CIC Division but rather by an individual referred to as the maintainer.

To create ASCII files of the UNICOS man pages, use the following command to remove the special characters for bold and underlining:

UNICOS 7.0 and 8.0: **man** *command_name* **| col -bx >** *filename*

Barbara Ritchie (**bxr@lanl.gov)**, (505) 667-7275
Communication Arts and Services (CIC-1)

Information About Change Control

ICN Change Control is the set of procedures that coordinates changes in the ICN to ensure quality control and smooth operation and to avoid introducing additional problems. In an environment as dynamic as the ICN, control must be imposed on the scope and timing of changes that involve many components. Please report any problems as soon as they occur by calling the ICN Consulting Office at (505) 667-5746.

The following CFS nodes are used for software that is maintained or announced through Change Control procedures. The files under **/ccx(s)/unicos** are deleted the last Friday of each month because these experimental versions become the production versions on all machines by the third Tuesday of the month. The other nodes keep the most recent versions of their respective software.

Non-UNICOS Systems	/*cc-node*/*platform*/*filename*
UNICOS Systems	/*cc-node*/**unicos**/*type*/*filename*

Where *cc-node* is:

ccx	Open change-control root node examples: **/ccx/mac/ppages** **/ccx/unicos/bin7/ppagesx** **/ccx/unicos/ubin7c/tedix** **/ccx/vax/ppages.bak**
ccxs	Secure change-control root node examples: **/ccxs/unicos/lib8/libcftlib.a** **/ccxs/sun/ppages.tar**

Where *platform* is:	Where *filenames* are:
aix	current executables for IBM RS6000-370 with AIX OS on Beta
alpha_osf	tar files for DEC Alpha OSF/1 machines
alpha_vms	backup save sets for DEC Alpha VMS machines
convex	tar files for Convex machines
dec_risc	tar files for DEC RISC workstations
dos	executables (**.exe**) for PC/DOS machines
hp	tar files for Hewlett-Packard workstations
ibm_rs6000	tar files for IBM RS6000 workstations
mac	binhex (**.hqx**) or MacBinary (**.mbin**) files for Macintosh computers
next	tar files for NeXT workstations
sgi	tar files for Silicon Graphics workstations
solaris	tar files for Sun Solaris workstations
sun	tar files for Sun OS workstation
ultrix	current executables to test on Beta (**ultrix** changing to **aix**)
unicos	executable **X** files or library files for current Change Control cycle
vax	backup-save-sets for VAX/VMS systems

Where *type* is:

bin#	binary files for version # of the operating system; note that an "x" is appended to the binary filenames
lib#	library files for version # of the operating system
u	user-supported executable files (**ex**, **ubin**, **ulib**, **udata**, **usys**)

If problems are discovered during the cycle, defective hardware or software is corrected, replaced, removed, or backed off.

Online Information

You can access complete online information about Change Control by linking to either of the following Web pages:

http://www.lanl.gov:8010/computer-information/ICNchanges
http://www.lanl.gov:8010/computer-information/ComputingNews/bits_homepage.html

Each of these Web pages includes this menu for ICNchanges:

Keyword Search of all ICNchanges (?)
Current (*month year*)
1995 Archives
1994 Archives
1993 Archives
1992 Archives
1991 Archives

Once you select a particular issue of ICNchanges, you then select which of these formats to use for viewing the articles:

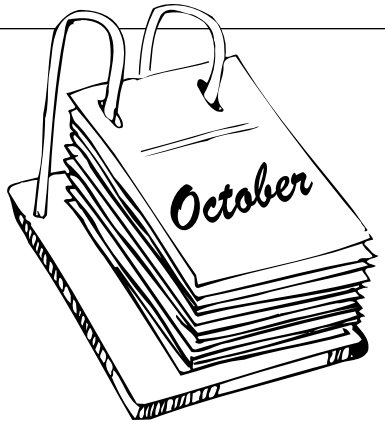
BITS: ICNchanges - ASCII Version
BITS: ICNchanges - HTML Version
BITS: ICNchanges - Acrobat Version
BITS: ICNchanges - PostScript Version

You may contact the Customer Service Center at (505) 665-4444 or **cichelp@lanl.gov** for assistance.

*Barbara Ritchie (**bxr@lanl.gov**), (505) 667-7275*
Communication Arts and Services (CIC-1)

OCTOBER DEADLINE

The deadline for articles for the October 1995 Change Control is 8:00 am. Monday, September 18, 1995. Please submit items to **bulletin@lanl.gov.**



CCF Machine Availability and Downtime

Machine Name(s)	Machine Type	Operating System	Security Partition	System Availability (July 1995)	Scheduled Downtime*
delta	CRAY Y-MP8/8-128	UNICOS 7.0	Secure	99.1	September 27 — 0400-0700
epsilon	CRAY Y-MP8/8-128	UNICOS 7.0	Secure	98.2	September 13 — 0400-0700
rho	CRAY Y-MP8/8-64	UNICOS 8.0	Open	97.2	September 13 — 0400-0700
zeta	CRAY Y-MP8/2-64	UNICOS 8.0	Secure	99.3	September 20 — 0400-0700
gamma	CRAY Y-MP/M98-82048	UNICOS 8.0	Open	95.8	September 20 — 0400-0700
tau**	CRAY T3D MC512-8	MAX 1.2	Secure	98.6	September 27 — 0400-0700
	CRAY Y-MP4I/464-2	UNICOS 8.0			
pi**	CRAY Y-MP EL92/1-256	UNICOS 8.0	Open	100%	
cluster	IBM Workstation Cluster	AIX	Open		
beta	VAX 6320 → IBM RS6000-370	ULTRIX → AIX	Open		
CCVAX	VAX 6410	VMS	Open		
OFVAX	VAX 6410	VMS	Open		
canyon	Thinking Machines Corp. CM-200	SunOS	Secure		
tres	Thinking Machines Corp. CM-200	SunOS	Secure		

* Additional downtime for the Cray machines may occur as a result of Network Dedicated Systems Time (NDST). The schedule for possible NDST is from 0600-0700 Mountain Time, Monday through Friday. Should NDST become necessary, a message listing the scheduled downtime will be broadcast on the applicable machines before the actual downtime occurs. For additional information contact the shift supervisor at (505) 667-4584. All times listed are Mountain Time.

** Access restricted.

Questions About Announced Changes?

Notice of all scheduled downtime will be broadcast on the machine before the downtime. For up-to-date machine status and scheduled downtime call: CCF Status Message (505) 667-5588.

Publication Information

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CUT ALONG DASHED LINE

Los Alamos
National Laboratory

INTEGRATED COMPUTING NETWORK (ICN) VALIDATION REQUEST

To access ICN Computing resources, please complete all parts of this form that apply to you, including "Special Requirements."

If you have **questions**: Call: (505) 665-1805
E-mail: validate@lanl.gov

Mail your completed application to:
ICN Password Office (PWO)
Mail Stop: B271
Los Alamos National Laboratory
Los Alamos, NM 87545

All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this request, users agree not to misuse the ICN. The Laboratory has the responsibility and authority to periodically audit user files.

Owner Information

Z-Number (if you have one)	PWO Use Only	Name (last, first, middle initial)
LANL Group	LANL Mail Stop	Citizenship (Foreign National see "Special Requirements-Foreign National")
Phone Number	Cost Center	Program Code

Check LANL affiliation:

- ☐ LANL employee
- ☐ Contractor _____ (specify contract company)
- ☐ Consultant, VSM, associate
- ☐ External user_____ (specify employer)
- ☐ Other (specify)_____

Send password / smartcard to:

☐ Mail Stop or ☐ Mail to address indicated below

Name / Organization

Address

City, State, Zip Code

Access Check access method and needed partitions:

Access method: ☐ ICN Password ☐ Smartcard ☐ Both

☐ **Open** partition (e.g., email systems, open machines)

☐ **Administrative** partition (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS])
If you are not a Q-cleared LANL employee, see required steps in section "Special Requirements-Administrative Partition," unless you already have Administrative access with an ICN password.

☐ **Secure** partition (i.e., secure machines) Indicate level(s) of data to be processed:
- ☐ Unclassified
- ☐ Secret

I certify this person does require secure access:

Manager Signature (Group Leader or above) Date

NOTE: A Q-clearance is required. All classified computing must be performed within the Secure environment.

PWO Use Only

New ☐ Change ☐	Clearance Status	Processed	Lv	Smartcard Serial #
Comments:				

Form 1646 (1/95) Supersedes previous versions (rev. 1/25).

Continue

Special Requirements

Administrative Partition
(U.S. Citizens Only) — Lab-Wide Systems (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS])

☐ Under 18 years of age

If you need to access Administrative systems, your group leader must provide a memo accepting responsibility for your actions and justifying your need for access. This memo is to accompany all forms taken to the security briefing (see "Contractor or Non-Q-Cleared") section below. You may not access the Secure Partition.

☐ Contractor or Non-Q-Cleared

Phone (505) 667-9444 to obtain Access Authorization packet.

Phone (505) 667-9153 to schedule a security briefing.

Bring all forms including this ICN Validation Request to the security briefing for approval.

Security Briefing Approval Signature	Date

☐ Foreign National

Attach a copy of Form 982 (REQUEST FOR UNCLASSIFIED VISIT OR ASSIGNMENT BY A FOREIGN NATIONAL) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not a visitor/assignee under a LANL/DOE approved Visit / Assignment Request, attach written justification from your host Division Director describing your need to access the ICN.

Authorization (required)

Print Manager Name (Group Leader or above)	Manager Z-Number	Group
Manager Signature (Group Leader or above)	**Mail Stop**	**Date**

If you are NOT a LANL employee, obtain your LANL contact's signature in addition to the contact's manager's signature.
NOTE: LANL contacts are regular Laboratory employees. Contacts are responsible for obtaining annual re-authorizations, forwarding renewals, and notifying the ICN Password Office of changes in user or contact status.

Print LANL Contact Name	Contact Z-Number	Phone Number	Group
LANL Contact Signature		Mail Stop	Date

Reader Feedback

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INDEX

This index is organized according to keywords taken from the original titles of *BITS* articles. Keywords are listed in alphabetical order and the coverage of articles goes back one year from the date of the current issue.

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http://www.lanl.gov/computer-information/ComputingNews/bits_homepage.html

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